★ SELL ELECTRICAL

ELECTRICAL WEST

★

GIFTS Bill Smith, our Master Salesman, suggests electrical gifts for Mother's Day, the June Bride, Graduation. He also suggests that everyone in the electrical industry can benefit by making the same suggestion to his friends.

McGraw Hill Co. of California • Price 25c per Copy

WHAT ABOUT THIS SUMMER?

If you haven't already laid plans for a summer sales campaign on hot weather electrical appliances . . . why not begin now?

The market is wide open on air-conditioning. More and more home owners are giving it careful consideration.

The new, improved electrical refrigerators offer a great opportunity for replacements as well as new sales.

And there's going to be the usual, intensive Edison advertising campaign to help things along.

Make your plans for this summer now—and you'll profit later.

SOUTHERN CALIFORNIA EDISON COMPANY LTD.

5-36

Edison — CALIFORNIA'S *Electrical Age* HAS JUST BEGUN!

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), May, 1936, Vol. 76, No. 5. Published monthly by the McGraw-Hill Company of California, 883 Mission St., San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shilling). Single copy, 25c.
Copyright, 1936. McGraw-Hill Company of California.

ELECTRICAL WEST

With which are consolidated the "Electrical Journal," the "Journal of Electricity, Power and Gas," and the "Journal of Electricity."

ESTABLISHED 1887

Staff

George C. Tenney, Editor
W. A. Cyr, Associate Editor
C. W. Leihy, Engineering Editor
Wayne Snowden, Assistant Editor
Roy N. Phelan, Manager
Hans Hjorth, Typography

▼

Editorial Advisory Board

Utilities:

R. E. Fisher, Vice-President in Charge of Public Relations and Sales, Pacific Gas and Electric Company, San Francisco

J. A. Hale, Chief Engineer, Utah Power & Light Company, Salt Lake City

Glenn L. Jackson, Vice-President and Commercial Manager, The California Oregon Power Company, and Mountain States Power Company, Medford

Frank McLaughlin, President, Puget Sound Power & Light Co., Seattle

L. T. Merwin, President, Northwestern Electric Company, Portland

W. C. Mullendore, Executive Vice-President, Southern California Edison Company Ltd., Los Angeles

Manufacturers:

Vernon Brown, President, Square D. Company, Inc., Los Angeles, Calif.

W. R. Marshall, Vice-President, Westinghouse Electric & Mfg. Co., San Francisco

A. S. Moody, Northwest Manager, General Electric Company, Portland

Wholesalers:

J. I. Colwell, Northwest Manager, Graybar Electric Co., Inc., Seattle

N. W. Graham, Graham-Reynolds Electric Co., Los Angeles

Contractors:

Lloyd Flatland, Globe Electric Works, San Francisco

S. G. Hepler, Arrow Electric Co., Seattle

Dealers:

H. H. Courtright, President, Valley Electrical Supply Company, Fresno

J. C. Chamberlain, Secretary-Manager, Bureau of Radio and Electrical Appliances, San Diego

▼

McGraw-Hill Company of California

883 Mission Street
San Francisco, California

Publishers of

ELECTRICAL WEST

James H. McGraw, Chairman of the Board
R. A. Balzari, President
George C. Tenney, Vice-President
Roy N. Phelan, Secretary and Treasurer

Member, Audit Bureau of Circulation
Member, Associated Business Papers, Inc.

Copyright 1936 by McGraw-Hill Co. of California

Contents for May 1936

Volume 76 Number 5

Results of Electric Heating at Mason City 17
Rural Load Building 19
Goodwill Building Ideas 21
Squire Phineas Brierwood . . . 23
Engineering Symposium 24
Cooperation on Parade 31
Appliance Sales Guide—Water Heaters 33
Bill Jones 41
With the Trade Associations . . 42
Electra's Husband Speaks of Those Who Have Forgotten the Language 44
Editorials 46
Significant Trends 48
News of Note 51
Where to Buy It in the West . . 66

▼

• BILL JONES returns. Illness kept Bill in bed and out of the pages of ELECTRICAL WEST. But it couldn't keep him down. He returns to delight his admirers with the sharp invective which he so successfully turns on slipshod thinking. On page 41, he talks about Imported Scotch. It is an eye-opener for many a manager, a nightcap for dogmatic notions, and an idea for everybody.

•

• SYNTHETIC FARMING steps from the realm of dreams into the stark actuality of commercial competition. For 7 years, Dr. Gericke has been experimenting at the University of California with plants grown in heated liquid nutriment. Plants as phantastic as Jack's legendary bean stalk have flourished by his treatment. Experimental and commercial results of the Gericke technique are published for the first time in the Rural Load Building section, beginning on Page 19.

•

• H. H. MINOR, in the penetrating analysis of a distribution problem, emphatically demonstrates how planning can save dollars, hundreds of thousands of them. This, the second of a series of articles by Mr. Minor appears in the Engineering Symposium.

• MASON CITY—Perhaps even more than for the fact that it is the "capital" of the Grand Coulee project in Washington State, Mason City has attracted the keen interest of the electrical industry as an experiment. Situated in a region where winters are severe, Mason City relies on electricity alone for its heat, light and power. Results of the experimental city's electrical "performance" begin on Page 17.

•

NEXT MONTH

• SPEAKERS, REPORTS, PRIZE PAPERS. These are outstanding, but they are only a part of the Convention-in-Print material which will attract the attention of the entire industry in the June issue of ELECTRICAL WEST. To the Northwest Light & Power Assn. and the Pacific Coast Electrical Assn. Convention-in-Print will serve as a focal point for cooperative effort. To the entire industry it will offer a record of the past and a vision of the future to commemorate another year of progress. Radio, constantly gaining strength as an advertising media, will be covered in its relation to the electrical industry in the June issue Radio Symposium.

VISUAL

POSSIBLE ONLY

Clear vision in Pyrex Gauge Glasses is maintained in spite of the erosive action of steam. High pressure resistance, heat resistance and chemical resistance are contributions to industry by Corning Laboratories.

INSPECTION

IN TRANSPARENT GLASS

ONE moment a shapeless mass of molten glass; a few seconds later, an insulator unit, precision shaped in a mould. From then on, continually inspected.

Only by deliberately ignoring obvious imperfections, could a faulty Pyrex insulator get on the line.

From the moment a Pyrex insulator leaves the mould until it is tied into the line, it is under constant visual inspection . . . clear through.

Externally, and more important, INTERNALLY, the condition of its structure is plainly evident.

If by any possible chance a Pyrex insulator should escape all the safeguards set up in routine factory inspection and test . . . it would never get by the vigilance of your own construction force. SEE all you are buying IN an insulator.

"PYREX" is a registered trade-mark and indicates manufacture by

CORNING GLASS WORKS
Corning, New York

Pyrex

POWER INSULATORS

G-E WHITE RIGID CONDUIT BOXES AND FITTINGS

For Economical and Permanent Protection

For permanent protection of wiring systems, use G-E White Rigid Conduit. It's made of the finest mild steel . . . double-galvanized and Glyptal-coated inside and out, including all threads. G-E White is resistant to heat, flame, gas, acids, alkalies and moisture. There is a complete line of Boxes and Fittings available.

GENERAL ELECTRIC

CONDUIT PRODUCTS

APPLIANCE AND MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONN.

CHECK THIS CHART TO SPECIFY BENJAMIN LIGHTING EQUIPMENT THAT EXACTLY FITS YOUR JOBS

1. For general lighting.

TURNLOX
RLM Dome

2. For soft, diffused lighting.

TURNLOX
Glassteel Diffuser

3. For lighting from the side.

TURNLOX
Elliptical Angle

4. For lighting high, narrow bays.

Aluminum
Concentrating Fixtures

5. For explosive locations.

Explosion-Proof
Fixtures

6. For grain elevators and explosive dusts.

TYPE 11-G
Dust-Tight Fixture

7. For damp or dusty locations.

VAPOR-SEAL
Fixture

8. For vapors and moisture.

HEAVY DUTY
Vapor-Proof Fixture

9. For vapors and moisture.

Industrial
VAPOLET Fixtures

10. For clean lamps and reflectors.

Dust-Tight
Glass Covers

11. For high intensity supplementary lighting.

INTENSIFIER

12. For signs and poster panels.

MASTER
Sign Reflector

BENJAMIN ELECTRIC MFG. COMPANY
WESTERN DIVISION OFFICE & WAREHOUSE
448 BRYANT ST., SAN FRANCISCO

BENJAMIN
TRADE MARK

BENJAMIN ELECTRIC MFG. COMPANY
DEPT. EW, DES PLAINES, ILLINOIS

Please send me a FREE copy of Cat. 26

NAME .....

FIRM .....

ADDRESS .....

CITY ..... STATE .....

Ultra Sensitive

MICROAMMETERS
MILLIVOLTMETERS
OF THE
DOUBLE PIVOTED TYPE!

For the measurement of minute currents, Weston now provides a group of ultra sensitive portable instruments which hitherto have not been commercially available in the double pivoted type. They can be used in the normal horizontal position without the necessity of leveling, and the long rectangular scale opening insures good illumination of the hand calibrated mirror scale. The instruments in ranges from 20 microamperes up are statically and magnetically shielded. Lower ranges, down to 5 microamperes, are statically shielded. Other outstanding features of this Model 622 series merit immediate investigation. Write for full details... Weston Electrical Instrument Corporation, 578 Frelinghuysen Avenue, Newark, N. J.

WESTON *Instruments*

PACIFIC COAST REPRESENTATIVES

Eicher & Bratt,
263 Colman Bldg.
Seattle, Wash.

C. F. Henderson,
420 Market St.
San Francisco, Calif.

A. A. Barbera,
Subway Terminal Bldg.
Los Angeles, Calif.

● Engineers seeking reliability and economy of long spans have for years depended upon the high strength-weight ratio of A. C. S. R.

A. C. S. R. meets the need for still greater rural line economy with its new stranding of 7 Aluminum over one steel. Strength is increased by 25%. Spans may be materially increased.

The basic economy is achieved without increasing stresses beyond sound values. There need be no compromise with dependability.

This 8-strand construction increases O. D.'s so little that you can use your standard fittings for equivalent 7-strand!

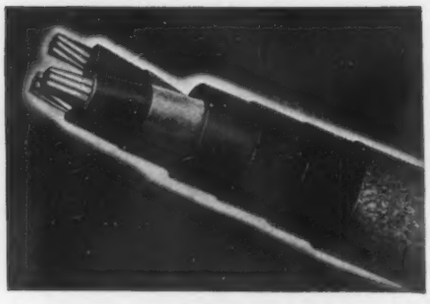
Consider also the use of Armor Rods. They provide simple and efficient protection against vibration-fatigue, abrasion and flashover burns.

May we send you data; or perhaps you would like a representative to call. Write ALUMINUM COMPANY OF AMERICA, 2132 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA ALUMINUM

TO "SHOW OFF" *Mother Nature*

BEFORE THOUSANDS OF TEXANS



THE City of Fort Worth installed an extensive flood lighting system to "show off" its beautiful Botanical Gardens at night. American Steel & Wire Company Non-Metallic Triple "L" Trench Cables were selected to supply current for these lights.

These Trench Cables are available in single, twin and multiple conductor constructions and in all sizes for any voltage. The insulation is our Amerite rubber which has low water absorption, perfect aging characteristics, and is in daily operation at voltages up to 13 K. V. Fibrous fillers are eliminated and replaced by an integral sheath and fillers of acid, alkali and water resisting compounds.

COLUMBIA STEEL COMPANY
Russ Building · San Francisco
Pacific Coast Distributors for
American Steel & Wire Company

Offices and Warehouses: San Francisco, Los Angeles, Portland, Seattle, Salt Lake City

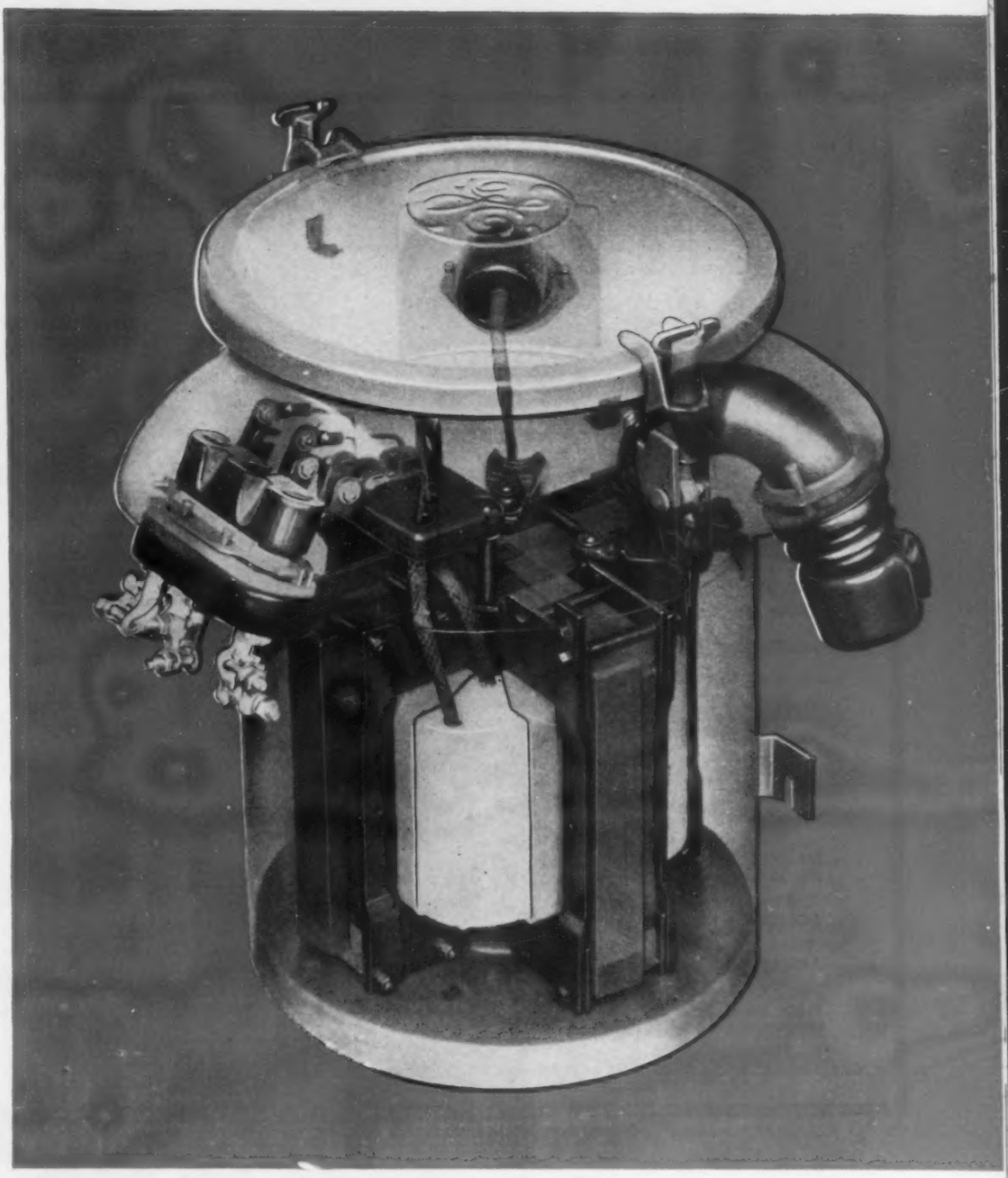
UNITED STATES STEEL

G-E DISTRIBUTION TRANSFORMERS

Designed FOR VALUE

GREATER
CONTINUITY OF SERVICE
★
BETTER
VOLTAGE REGULATION
★
ADDED YEARS OF
FAULTLESS PERFORMANCE
★

The value — measured in terms of service — that you obtain in G-E distribution transformers is a result of unflagging attention to many "tremendous trifles" of design and manufacture — of constant striving for Perfection of Detail.



Also available with "Self-contained Lightning Protection" by true valve-type lightning arresters

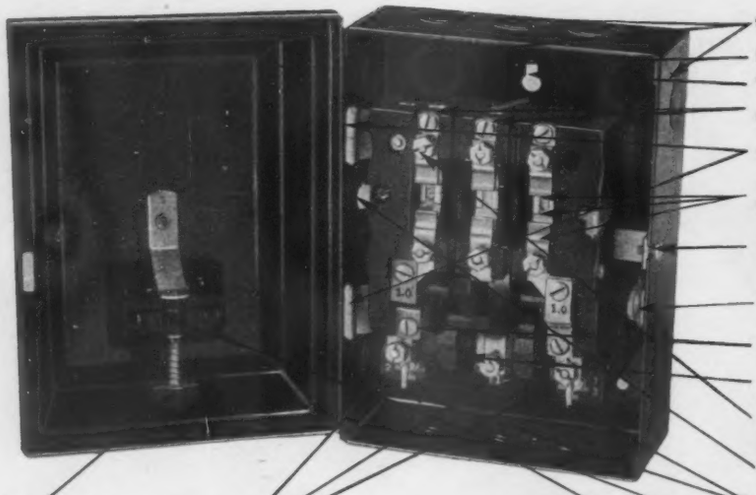
300-36

GENERAL ELECTRIC

HEADLINE HUNTER

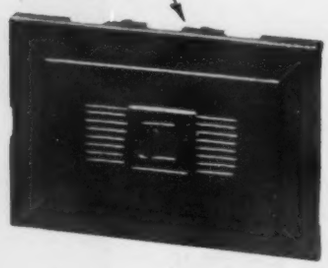
the 38 features of the SQUARE D CLASS 8536 TYPE H32 STARTER IS MAKING MOTOR CONTROL NEWS EVERYWHERE

Directly below are featured some specific examples of the engineering innovations incorporated in the new Class 8536 Type H 32 Square D A.C. automatic starter. Performance factors and refinements contributing to its long life, however, can't be photographed. Its high rupturing capacity, its low coil current, its low undervoltage pick-up and seal, its absence of vibration, its heavy, bimetallic, non-welding contacts, its oversized bearings and its wear-resistant magnet steel . . . all these salient points, too, contribute materially to its unsurpassed performance and its adaptability to your motor control problems. Maximum capacity—5 h.p., 220 volts or 7½ h.p., 440-55 volts, 2 or 3 phase.



CONVENIENT CONCENTRIC KNOCKOUTS
LARGE WIRING SPACE
THREE POINT SUSPENSION—EASY MOUNTING
ACCESSIBLE COIL TERMINAL
SEPARABLE PIN-TYPE HINGES
ACCESSIBLE DOUBLE BREAK CONTACTS — EASILY RENEWABLE SILVER TO SILVER STRIPE METAL
SINGLE SCREW TO LOOSEN TO SWING OUT INTERIOR
EASY OPERATING POSITIVE CATCH
RECESSED THERMAL RELAY—TAMPER PROOF—MICA LINED HEATING ELEMENTS VERY ACCESSIBLE
ACCURATE DIE-CAST BAKELITE RELAY PARTS
CONVENIENT SLOTTED HEXAGONAL NUTS
ARC SHIELD SPRINGS EASY TO INSPECT CONTACTS
CONVENIENT OVERLOAD RELAY ADJUSTING LEVERS
TOGGLE TYPE CONTROL LEVER NO FLEXIBLE CONTROL LEADS TO COVER TO DISCONNECT WHEN REMOVING PANEL
LARGE WIRING SPACE
MOLDED ARC-RESISTANT SHIELD

RELAY RESET LEVER
ACCESSIBLE TERMINALS
ACCESSIBLE COIL TERMINALS
LONG-LIVED OVERSIZE BEARINGS
"E" SHAPED MAGNET — PARKERIZED TO PREVENT CORROSION
MAGNET RETAINING CLIPS. SIMPLY PRESS UP AND OUT TO RELEASE MAGNET
ACCESSIBLE MAGNET AND COIL BY SWINGING OUT INTERIOR
ARMATURE MOTION VERTICAL—VIBRATION PROOF
STEEL CHASSIS — ADAPTABLE FOR MOUNTING IN SPECIAL ENCLOSURES



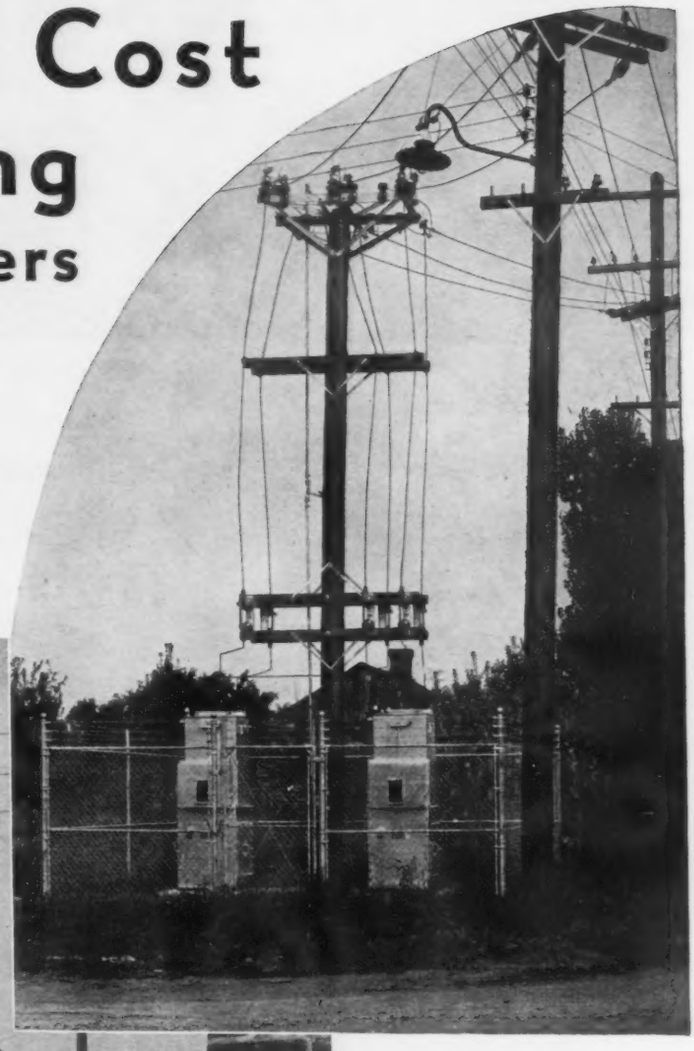
CALIFORNIA'S *Electrical Age* HAS JUST BEGUN!

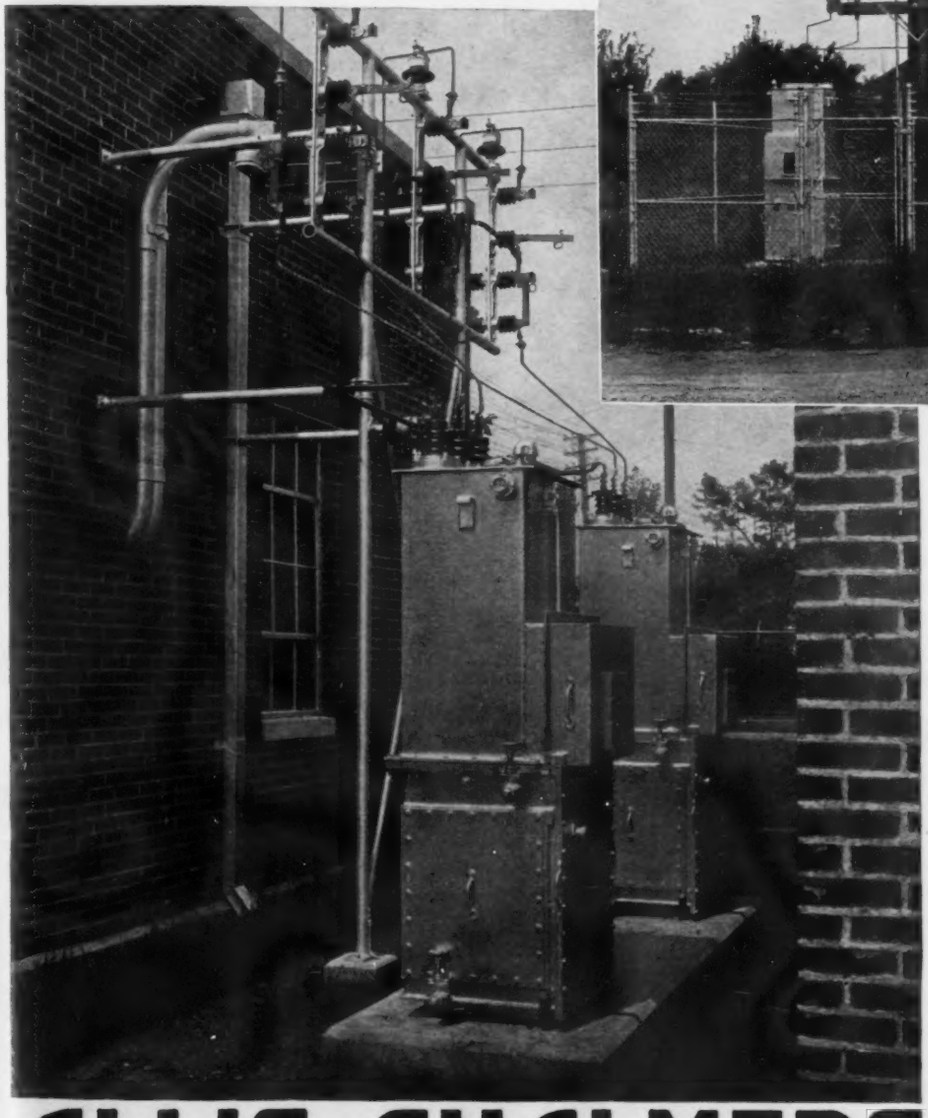
CALL IN A SQUARE D MAN

SQUARE D COMPANY
LOS ANGELES CALIFORNIA
DETROIT, MICHIGAN • MILWAUKEE, WISCONSIN
SQUARE D COMPANY CANADA LTD TORONTO, ONTARIO

Reduce the Cost of Regulating 2400-volt feeders

Use Allis-Chalmers AFR Regulators with 5/8% steps. ... The first cost is low, efficiency high, exciting current very low, impulse strength exceptionally high and operation is noiseless.





Typical 2400-volt outdoor installation of type AFR Regulators (200-amp. units.)

AFR REGULATORS operating on the transformer and tap-changing under load principle and with such small steps as to give "stepless" operation, can be furnished in single or three phase units, for any voltage or frequency, indoor or outdoor, with oil-immersed current limiting reactors built integral, if desired, for automatic or non-automatic control, and with or without line drop compensation

... Bulletin 1170 gives construction and application data on these money saving regulators. Write for your copy.

ALLIS-CHALMERS WESTERN SALES OFFICES

Denver, Colo. Continental Oil Bldg.
Los Angeles, Calif. - Rowan Bldg.
Phoenix, Ariz. - - Luhrs Tower
Portland, Ore. 1311 S.E. Union Ave.
Salt Lake City, Utah Kearns Bldg.
San Francisco, Calif. - Rialto Bldg.
Seattle, Wash. - - Henry Bldg.

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee, Wisconsin, U.S.A. —

HOTPOINT'S SUMMER CAMPAIGN

Now Ready for You

See the "Over-The-Hump" Plan Book for July and August. See how easily this material may be adapted to your individual use.

THE NEW CAMBRIDGE—Hotpoint's new style winner in full porcelain enamel with chromium trim—3 Calrod Units and Thrift Cooker are standard.

"Over-the-Hump" is title of summer activity. Campaign material is new, novel, complete in every detail. Plan Book now ready for distribution. "Get the Order" still is keynote.

Get your share of the booming electric appliance business. Swing into line with the popular new leaders—the electric range and water heater. Public opinion, new building and remodeling are sweeping the range business into unprecedented prosperity. Now is the time for you to get aboard this new bandwagon.

Hotpoint National Advertising Reaches 11,000,000 Families

Hotpoint is telling nearly every second family in America the miracle story of the electric range. Full-page advertisements in Saturday Evening Post, (see opposite page) Ladies' Home Journal, Good Housekeeping, McCall's, Better Homes and Gardens are creating new buyers in your town.

Tie up with this sales-producing activity by starting a summer sales drive now. Hotpoint's summer campaign, with completely organized plans, retail salesmen's contest, new direct mail material, newspaper advertisements and window display, are now ready.

Ask the Hotpoint representative in your district to show you Hotpoint's "Over-the-Hump" Plan Book. Learn all about the "Year 'round Program."

EDISON GENERAL ELECTRIC APPLIANCE CO., INC.

5612 West Taylor Street, Chicago, Illinois

WATER HEATERS, TOO

Hotpoint now offers the only complete line of rectangular electric water heaters at lowest prices in history. Complete plans, sales and advertising material are now ready to help you build volume sales of water heaters. Write for full details today.

ELECTRIC Hotpoint RANGES

WATER HEATERS

PRINT IN BINDING

CRASH! went a sledge hammer on this Calrod Unit

20 MINUTES LATER IT WAS COOKING A FLUFFY OMELET

ONE of the series of color page advertisements in the Saturday Evening Post telling Calrod's dramatic story to nearly three million families and creating a nation-wide acceptance for this great hi-speed heating coil.

punishment proves ruggedness of the amazing sealed-in-metal heat-ment that opens a new era of speed and economy in electric cookery

UND that Calrod with your dge," said Hotpoint engineers to iron worker, "Give it all you've Crash! went the heavy hammer— Calrod heating element was un-. Twenty minutes later, plugged otpoint Electric Range, it was g a fluffy omelet.

Calrod has survived a score of dramatic tests of its strength, lity, speed and economy.

is the greatest advance in elec-okery since George A. Hughes ed the electric range. It obsoletes ther type of heating unit—brings odern miracle of swift electric y within the reach of every home.

Calrod electric element the heat-il is sealed and insulated in a f enduring metal—protected for-om damaging contact with air, ure, dust and dirt. Since cooking s rest directly on the glowing coils no heat is wasted. Every bit is used for cooking and far less current is consumed. Besides cooking starts much quicker and therefore takes less time.

Go to your electric company and see this latest electrical achievement. View the beautiful new Hotpoint ranges equipped with Calrod units. Compare them point by point and feature by feature with other ranges. When you add the benefits of Calrod to their other advantages your choice will be easy.

Mail the coupon below for full information about Hotpoint Ranges. An interesting and instructive booklet entitled "Your Kitchen Modern" will be sent you promptly.

IF YOU ARE BUILDING OR REMODELING

Be sure to wire your new home for an electric range and water heater. Houses without these modern appliances will soon be out-of-date. See your architect, builder or electric company about this essential improvement.

CALROD! What Mazda means to light—Calrod means to cooking. Calrod is Hotpoint's hi-speed sealed-in-steel heating coil. This great scientific advance fully utilizes electricity as the perfect cooking aid. Calrod makes your cooking far quicker—cleaner—more economical.

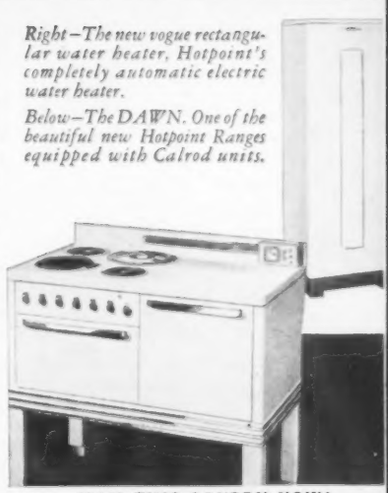
Hotpoint

Calrod

ELECTRIC RANGES AND WATER HEATERS

Right—The new vogue rectangular water heater. Hotpoint's completely automatic electric water heater.

Below—The DAWN. One of the beautiful new Hotpoint Ranges equipped with Calrod units.



MAIL THIS COUPON NOW!

Hotpoint, Department B
5615 W. Taylor St., Chicago, Ill.

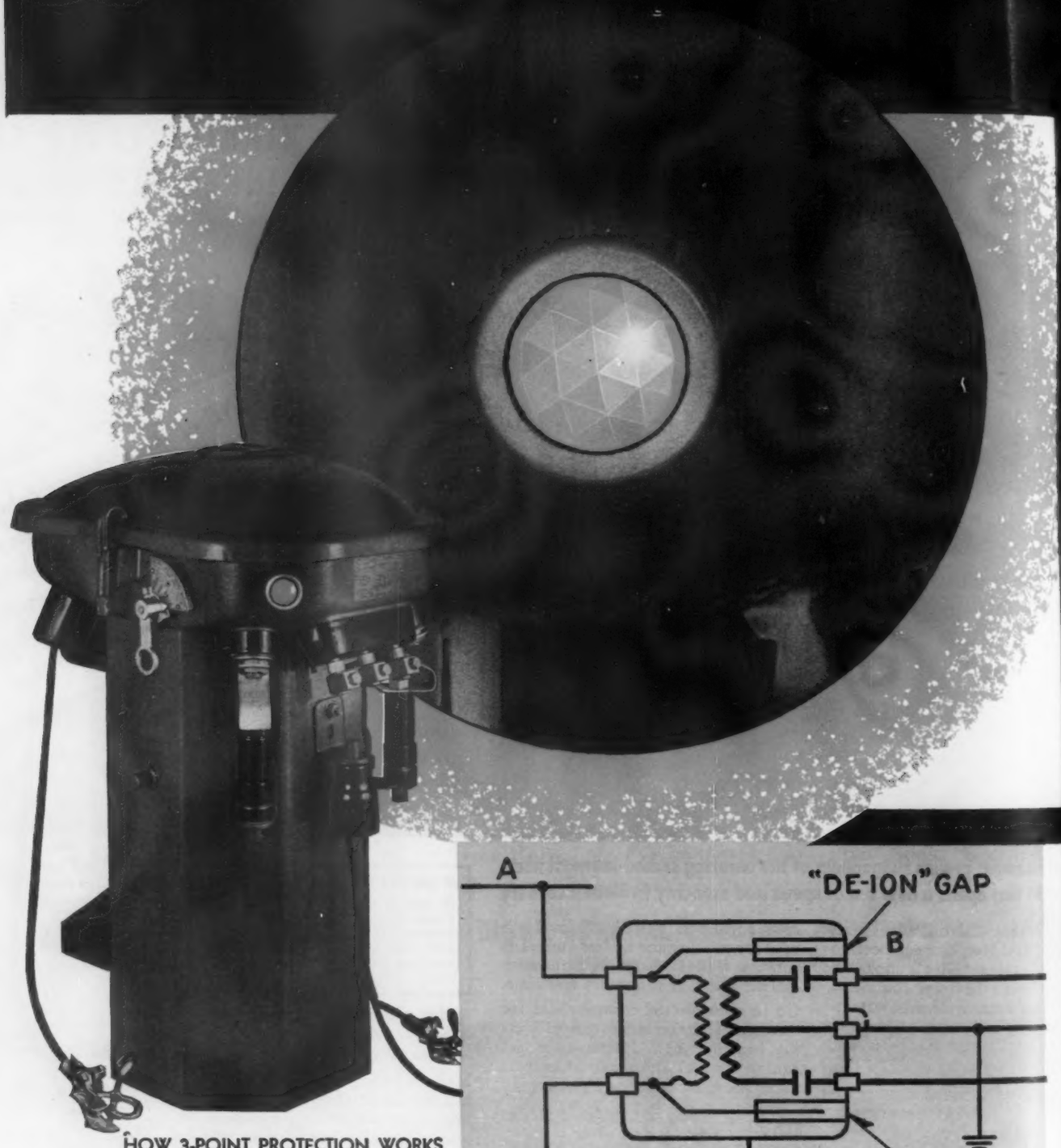
Please send me booklet "Your Kitchen Modern"

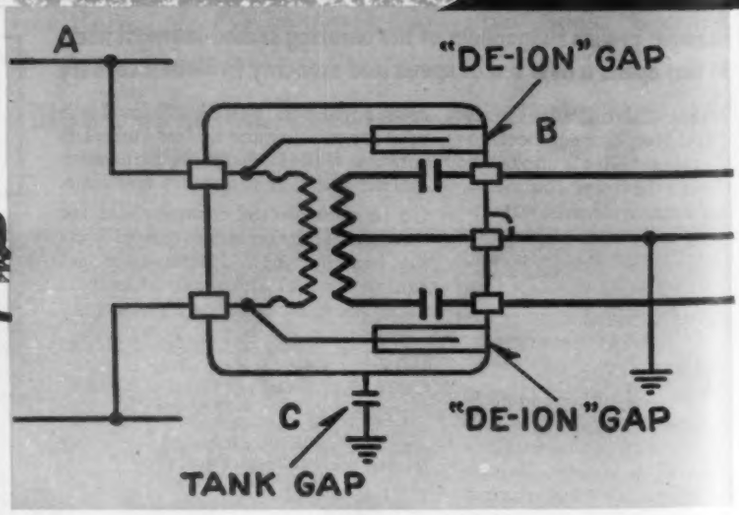
Name_____

Address_____

City_____ State_____

A Warning Signal





HOW 3-POINT PROTECTION WORKS

A surge entering primary lead, A, follows the winding until the voltage rises to the breakdown value of the "De-ion" gap, B. The gap discharges to the tank and then harmlessly through discharge gap, C, to ground.

...that Spells...

I-N-V-E-S-T-I-G-A-T-E

IT'S easy to determine when a Westinghouse CSP transformer is seriously overloaded. Built into this completely self-protecting distribution transformer at the suggestion of utility engineers, the signal lamp indicator sees to that.

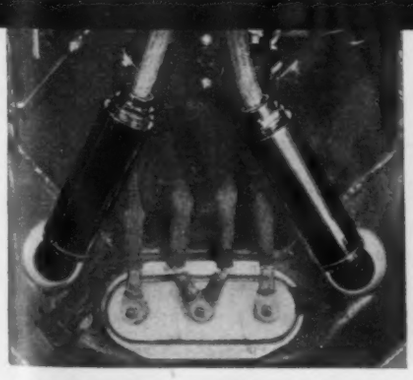
A positive acting circuit breaker in the secondary circuit of the CSP transformer adequately protects the windings against possible burnout from either short circuit or overloads. When this breaker opens the transformer circuit the light goes on . . . and stays on . . . indicating to the maintenance men that the transformer is out of service.

But that's not all. This light also gives warning of a sustained overload before the breaker trips. Thus, if the light glows when the transformer is still operating it is an indication that the transformer is seriously overloaded. By moving the breaker handle to the halfway position, the light signal can be reset without opening the breaker and will not indicate until overloads again raise the temperature of the transformer windings to a dangerous value.

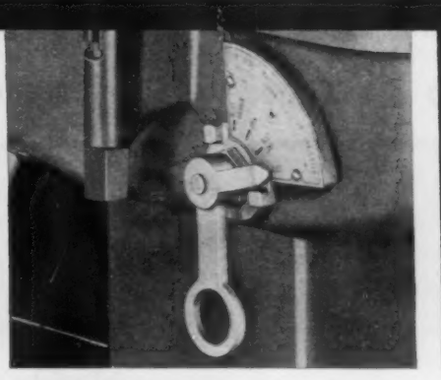
Load surveys in connection with CSP transformers can thus be eliminated since overloaded transformers that should be replaced by larger capacity units are automatically indicated.

This and other features such as complete self protection against both lightning and burnout make the CSP transformer the standard of comparison. Get complete information today. R 59033

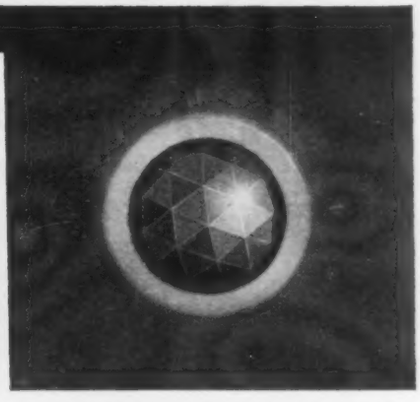
Westinghouse



3-Point Protection with "De-ion" gaps detours lightning surges to ground, and limits to a safe value voltage stress across insulation between (1) High-voltage winding and core or tank (2) Low-voltage winding and core or tank (3) High-voltage and low-voltage windings.



The circuit breaker in the secondary circuit gives positive protection against burnouts from either sustained overloads or short circuits. It can easily be reset by moving the external handle to the reset position and then to close.



The signal lamp gives visual indication of an overloaded transformer, and also serves as a tell-tale signal of a transformer whose breaker has tripped. Thus, load surveys in connection with CSP transformers can be eliminated.

How this premium offer sways June crowds to you

Profit from wedding gift buying

Decorative Shell as a premium

This year SILEX gives you an opportunity to get a new and larger share of the tremendous June spending. This year you sell SILEX for wedding presents, for summer home furnishings, for cool electric table cooking during the summer. This year you can set a new high sales record for June.

That you may stimulate intensive consumer interest in SILEX, that you may keep your cash register jingling, we have enhanced the appearance of our two most popular models, giving them special and appealing value . . . and attractive deluxe appearance. With them we give as a premium . . . the Decorative Shell.

A $3.70 value for $3.25

Electric Table Model pictured above with the premium Decorative Shell. Same premium offered with Everyday Kitchen Model.

A $5.70 value for $4.95

Special Display boxes for both Electric and Kitchen Models (Everyday Kitchen Model box shown above) provide interest-compelling window or counter displays. Your opportunity to draw attention and increase sales.

Genuine SILEX
GLASS COFFEE MAKER

Special Values bring big sales

Here are the SILEX Specials to drive in extra business during June. The Silex Junior Electric Table Model, in red or black trim, offered for one month only, with a 75 cent chromium Decorative Shell as a premium, a $5.70 value for only $4.95. The Everyday Kitchen Model, in red or black trim, with Decorative Shell as a premium, a $3.70 value for $3.25.

This offer expires June 30, 1936.

Win the big June trade with these sales helps

for profitable information

The Silex Co., Dept. (EW5)
Hartford, Conn.

Send me today, without cost or obligation, complete details regarding your big premium for stimulating more June gift buying in my store. I understand this offer expires June 30, 1936.

NAME .....

STREET .....

CITY..... STATE.....

In addition to the special packaging, Silex furnishes you additional helps to make this promotion of June Specials a tremendous success. A selection of 6 dealer mats. Sparkling foil display signs. Here is your whole advertising campaign . . . the newspaper advertisements . . . the window display . . . the counter display . . . the special package. Take advantage of this opportunity. Arrange your windows and counters to win more June trade. Use the newspaper mats to bring more people into your store.

ELECTRICAL WEST

[*Devoted to the economic production, transmission and distribution of electric power and its application to industry, commerce and the home in the Pacific Empire, and to the sale and distribution of electrical utilization devices, equipment and appliances in that area*]

May 1936

Results of Electric Heating at Mason City

LOAD characteristics, consumption and other pertinent data, particularly with respect to electric heating, covering a full year's operation of Mason City, all-electric town at the site of the Grand Coulee dam in central Washington, are now available. Basis for calculations and speculation regarding the future of electric heating are contained in the results which were described to the San Francisco Chapter of the Electric Heating Society recently by Juan Hargrove, architect for the Mason-Walsh-Atkinson-Kier Co., contractors for the dam. Mr. Hargrove designed and laid out Mason City and was directly responsible for the specifications of electric heating, having supervised the installation and studied its operation throughout 1935.

The entire Grand Coulee project, with a total connected load of 33,000 kw. of which 12,250 kw. is in Mason City and the balance on the construction works, consumed 42,201,000 kw.-hr. during 1935 of which 12,301,630 kw.-hr. represented the consumption of the all-electric city with its population of 3,000. This quantity of energy provided lighting, appliance service, refrigeration, cooking, water heating and heating for the entire city consisting of 288 residences, 114 bunk houses, 19 central lavatories, mess hall and business establishments.

Economics and the necessity for speed in construction dictated the selection of electric heating. A central heating plant to handle the bunkhouse area of 19 blocks (each block contained five 24-man bunkhouses, one foreman's bunkhouse and one lavatory) would have cost $210,000. Until completion of the railroad it would have been necessary to haul fuel (either coal or oil) to the job 27 miles by truck. Estimated cost of heating each of the houses was placed at $300 exclusive of basements.

Cost of electric heating, including hot water, was balanced against these figures. A distribution systme to serve the 19 blocks of bunkhouses was figured at $4,650. The addition of electric heating and hot water heating would increase this figure to $32,320. Equipment costs included 182 kw. of electric heaters per block or a total of 3,458 kw. at $27,664; nineteen 500-gal. hot water heaters, $6,450; additional electric wiring for the heating installation, $6,916; 2,000-kw. main transformer bank, $8,000. The total additional electrical costs attributable to the heating and hot water added up to $76,900 as compared with $210,000 for the coal fired central heating plant.

In the residential area the distribution system without electric heating but including lighting, cooking and water heating, was placed at $16,650. To add electric heating would raise this figure $13,575. Equipment costs included 3,536 kw. of heaters, $35,360; wiring for heaters only $7,070 and a 2,100-kw. transformer bank, $8,400. The total investment of $57,325 for heating the 288 residences thus gave an average of

Chimneyless Mason City on the banks of the Columbia River in Washington. Here a population of 3,000 persons kept warm during the winter of 1935 with electric heating. Housing workers on the Grand Coulee project, and their families, the all-electric city represents a connected load of 12,250 kw., exclusive of power drawn by the construction works

$181.50 each as compared to $300 for furnace installation.

On the basis of these figures electricity was selected as the source of heat for the entire city.

A typical block in the residential area contained eight houses served from a bank of three 50-kva. transformers with the following electrical load:

4 four-room houses, 29.5 kw. each.....92 kw.
Lights and appliances 2 kw. each
Cooking, 8.5 kw. each
Water heating 2.5 kw. each
Heating 16.5 kw. each
8 Three-room houses, 26.5 kw. each...212 kw.
Lights, appliances, cooking and water heating same as 5-room houses.
Heating, 13.5 kw. each.

In the 4-room Type "C" houses the heating installation consisted of five Wesix heaters as follows: living room 5 kw., kitchen 3 kw., bedroom 4 kw., bedroom 3 kw. and bathroom 1½ kw. In the 3-room Type "B" houses the installation was identical except for the elimination of the 3-kw. bedroom heater.

Each of the 19 blocks of bunkhouses was served also from a bank of three 50-kva. transformers and each block consisted of the following:

5 12-room bunk houses, 30 kw. each..150 kw.
Lights, 2 kw.
Heat, 28 kw.
1 Eight-room bunk house.....32 kw.
Lights, 2 kw.
Heat, 30 kw.
1 Lavatory.....43 kw.
Lights, 2 kw.
Water heaters, 28 kw.
Heat, 13 kw.

In the 12-room, 24-man bunkhouses a 3-kw. heater was installed in each of the four corner rooms and a 2-kw. heater in the remaining eight. The foremen's bunkhouses contained a 6-kw. heater in the recreation room, two 1-kw. units in the hall, 3-kw. heaters in two of the bedrooms and 2-kw. units in the other six, a 1.5-kw. heater in the bathroom and a 2-kw. unit in the lavatory.

The complete electric heating installation at Mason City comprises approximately 3,000 Wesix heaters of various capacities. In the heating installation no advantage was taken of automatic temperature control or of insulation. Neither were there any limitations on the use of the heaters.

Data on the monthly consumption of 215 houses of which 88 were of the 4-room type and 127 of the 3-room type are contained in Table 1. Average annual consumption of the 29.5-kw., 4-room houses was 21,770 kw.-hr., or a monthly average of 1,814 kw.-hr. For the 3-room, 26.5-kw. houses the average annual consumption was 17,480 kw.-hr., or a monthly average of 1,456 kw.-hr. Maximum monthly consumption of the largest consumer in the 4-room group was 5,323 kw.-hr. which occurred in November when the mean temperature was 32.6 deg. F. In the 3-room group the maximum consumption was 4,670 kw.-hr., occurring in December when the mean temperature was 29.3 deg. F. The highest daily consumption of any of the 4-room houses was 356 kw.-hr. on Jan. 17, 1935, when the mean daily temperature was 11.5 deg. In the 3-room group the highest daily requirement was 269 kw.-hr. on Jan. 18, 1935, when the mean temperature was -5 deg.

Top, typical block of Mason City homes—no chimneys. Center, electricity heats and lights the living room. One of Mason City's all-electric kitchens. Heating, cooking, water heating, lights and appliances are all electrical. Not shown are the electric refrigerator and water heater

Table I—Monthly Consumption for 215 All-Electric Houses at Mason City for 1935

Month	Total Consumption Kw.-hr.	Heating Only Kw.-hr.	Mean Monthly Temp. Deg. F.
January	636,870	510,308	28.9
February	516,288	389,726	38.3
March	432,557	305,995	42.1
April	397,596	280,064	...
May	191,885	74,353	...
June	129,827	12,995	...
July	117,322	.....	...
August	116,987	.....	...
September	132,220	14,688	...
October	227,062	101,500	...
November	602,071	475,509	32.6
December	645,931	519,369	29.3

Table II—Monthly Kw.-hr. Consumption Grand Coulee Project for 1935

Month	Total for Project Kw-hr.	Town Only Kw.-hr.
January	3,277,000	1,410,757
February	3,297,000	1,489,222
March	3,682,000	1,266,114
April	3,277,000	1,314,319
May	3,050,000	433,117
June	2,976,000	388,367
July	3,034,000	360,242
August	2,519,000	379,539
September	2,929,000	410,786
October	3,996,000	1,195,360
November	4,615,000	1,780,073
December	5,549,000	1,873,758

Monthly electrical consumption for the entire Grand Coulee project for 1935 is shown in Table II. Construction equipment consisting of belt conveyors, electric shovels and pumps had a connected load of 20,750 kw. and the town a connected load of 12,250 kw. In addition to the residences and bunkhouses the town contained, among others, the following buildings: mess hall, 440 kw.; hospital, 140 kw.; store, 200 kw.; theater, 79 kw.; laundry, 50 kw.; mortuary, 39 kw.; postoffice, 19 kw. and bank 18 kw. Peak demand for the entire city load, including the heating, was 4,800 kw. On the basis of total consumption of 12,301,630 kw.-hr. this shows an annual load factor of 29.3 per cent.

Tests are being conducted under the auspices of Washington State College on insulated and uninsulated houses and on one house heated by means of a storage system.

Results on the heating of Mason City, where a large scale installation was possible and where climatic extremes provided a variety of operating conditions afford the industry comprehensive data covering the ultimate possibilities of electric heating as a source of revenue both from equipment sales and from the load created.

Electrochemiculture

Portending new developments in agricultural technique, the experiments conducted at the University of California on growing flora in heated liquid culture media opens new markets for the electrical industry. Here are the first published results of the experiments by Dr. Gericke in which the California C.R.E.A. has had a vital interest.

GROWING of fruits, vegetables and flowers in a heated nutrient liquid culture media instead of soil appears commercially feasible. Seven years of experimental work conducted by Dr. W. F. Gericke, of Berkeley, Calif., have culminated in commercial installations for the production of tomatoes. Experiments with tobacco, cucumbers, gardenias, papaya and gladioli in heated culture media indicate revolutionary possibilities for development in agricultural technique, particularly as regards crop-forcing and off-seasonal production, the ultimate significance of which beggars the imagination. Potential yields on a comparative unit area basis—nutrient liquid tanks vs. soil—show manifoldly larger yields for the tanks.

The Gericke technique consists of supplying the nutrient elements essential to plant growth to water contained in concrete or redwood basins and maintaining this fluid at a constant temperature by means of electric soil heating cable. (A closed circulating system for the fluid in which the heat is supplied by combustion of natural gas has been employed in one commercial installation in place of electricity.) On top of the basins is a wire screen covered with excelsior, peat moss or straw to prevent seeds from falling into the fluid with a supplementary covering of excelsior, straw or rice hulls to provide a supporting medium for the young plants and insulation against heat losses through radiation. As the seeds sprout, the roots extend into the culture media from which they then absorb their food.

Natural light and temperature changes have been found to be essential to proper plant photosynthesis. To date most of the experiments have been conducted in unheated greenhouses.

Essentially the success of the technique depends upon the adequate supply of plant food made available under conditions most favorable for assimilation and plant growth. The foods are placed in a glass cell which permits ready solubility at a regular rate. Ten or more elements in all are used and they are mixed in definite ratios depending on specie and climate where the crop is grown. Sulphuric acid is injected to maintain a slightly acid reaction in the solution. All ingredients are today products of the heavy chemical industries and natural resources are available for their production.

In experiments to date the technique appears to apply most successfully and economically to those species of flora which are high in water, sugar and starch content, where quality or intrinsic value are important. Inasmuch as the composition of plants can be affected, it is possible that some unique characteristic can be imparted to certain food plants.

Dr. Gericke's successful experimental work on which the commercial applications for tomato production have been based, were conducted with a large array of plants. Sheet metal basins 10 ft. by 2.5 ft. by 8 in. containing 15.65 cu. ft. of water and heated with a standard 60-ft. length of soil heating cable were employed. Various temperatures were maintained in the solution, with the majority of tests run at 75 and 85 deg. F. Assistance in the experiments was furnished by the California Committee on the Relation of Electricity to Agriculture.

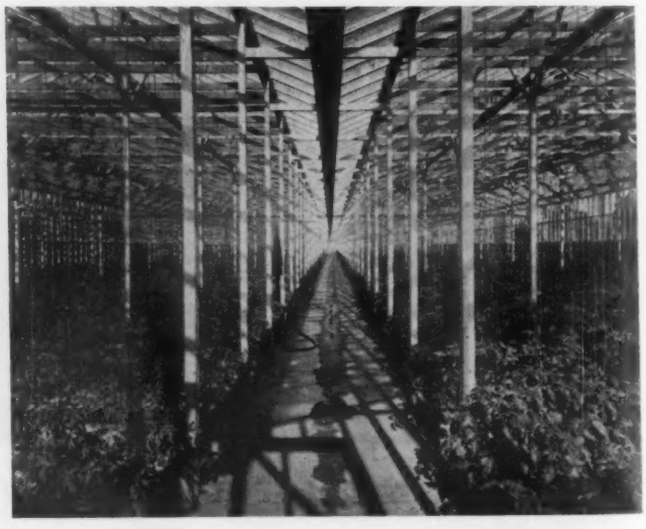
With tomatoes surprisingly large yields were produced from the test basins. Practically every flower formed fruit and numerous trusses of *Sutton's Best* contained from 15 to 25 tomatoes. Likewise, yields of amazing proportions were obtained with gladioli and tobacco also grown in heated liquid. With gladioli production was speeded up and the size and quality of the resultant

At left, exterior of Vetterle & Reinelt plant at Capitola, Calif., where tomatoes are grown commercially by Gericke technique. At right, the switchboard and distribution panel, life-center of the miniature plant world. It is the control point for the heated nutriment system

Gladioli bloomed earlier and were larger when grown in the heated liquid nutrient. At the left are blooms in a heated tank and at the right in an unheated one. Both were planted at the same time

Below is an aisle down the interior of the Vetterle & Reinelt plant at Capitola, Calif. Tomatoes, being raised on a commercial scale, are nourished by heated liquid nutriment. Five months after planting, the tomatoes will be on the market

At the left are tomato plants growing in their basin-beds of heated liquid nutriment. They are photographed on their month-by-month birthdays. From top to bottom they are respectively 2, 3, 4 and 5-months old. At 4 months (next to bottom) they are heavily laden with ripe fruit; at 5 months (bottom) fruit has been harvested from the lower section of the vines. Great size of the plants can be compared to the 6-ft. height of Dr. Gericke



Concrete tanks at Capitola, showing wood crossmembers for support of the wire netting frames on which the tomatoes grow

Three months after planting, these plants in unheated nutriment are less than 2 ft. high. See second from top picture at left of page for same age in heated liquid

flowers were superior to field grown blooms.

Commercial installations employing the technique in the raising of tomatoes are in operation at Capitola in central California and Montebello in southern California. The crops were marketed during the 1936 winter season in competition with hot-house fruit. Typical installation is that of Vetterle and Reinelt at Capitola. This consists of a double unit greenhouse 80x200 ft. It contains 66 concrete basins 36 ft. by 4 ft. by 6 in. arranged in two rows of 33 each. Basins are insulated on the bottom with 6 in. of beach sand to reduce heat losses.

Heating of each basin is accomplished with three 120-ft. lengths of G-E soil heating cable arranged in parallel across 220 volts, or a total of 2,400 watts per basin. The basins are connected in pairs with each pair controlled by a separate 30-amp. switch and thermostat. Each row of 33 basins is arranged in two groups of 12 basins and one of 9 basins with sufficient feeder capacity provided for the latter for adding three more basins. Each group of 12 basins is controlled by a 100-amp., 3-phase switch. Service is from a 3-conductor, 600,000 circ. mil, 220-volt cable. The main service consists of three 750,000-circ. mil cables with a 600-amp. main service switch. Total connected load is 158.4 kw.

Greenhouses and basins were completed late in October. Two varieties of tomatoes, *Sutton's Best* and *Sutton's Majestic*, were planted. The initial temperature maintained in the nutrient liquid was 80 deg. F. This was later reduced to 75 deg. and finally to 65 deg. after the plants had begun producing. Load charts showed that energy consumption averaged approximately 4 hours per day, with most of the consumption off-peak. A typical chart showed consumption between 11:30 p. m. and 1:30 a. m. and 6 a. m. and 8 a. m. It is believed that by increasing the temperature of the nutrient liquid during the night hours so as to store heat, the entire load could be confined to off-peak hours. With the 66 basins in operation the average consumption between November and March was 30,000 kw.-hr. per month. As the temperature was decreased consumption also fell off.

The vines began to bear in February. As this article is written the peak production has not been reached although a total producing period of 100 days is indicated, all of which will be off-seasonal. The proprietors are well satisfied with the operation of the installation.

Small installations have been made for studying the technique for ultimate commercial growing of sweetpeas and other blooms at Richmond, Calif., and a similar one for strawberries at Watsonville. The Montebello installation was planted to tomatoes.

The commercial enterprises now in operation are under Dr. Gericke's direction and his personal attention is required from time to time to devise such alterations in cultural technique as the circumstances may warrant. Cultural technique must be adjusted to meet not only the character of the crop grown but also the climate in which it is grown, and consequently before the method can be made available for general use it needs to be tested over fairly wide geographical distribution. These tests would be contacted by Dr. Gericke from time to time, and any needed cultural adjustments made.

These experiments represent the next phase of the investigations to be undertaken and they are to provide the needed information for preparation of full and reliable directions for the ultimate general use of liquid culture media for crop production. The integration and interpretation of data on the response of plants to diverse climatic conditions furnishes the basis for the needed information. A limited number of tests organized as commercial enterprises and located over a fairly wide geographical distribution will be undertaken as soon as arrangements can be made. It is the purpose of this comment to save Dr. Gericke's time in answering inquiries from interested persons who would not be in position to aid the development of the enterprise.

Ultimate development and significance of the water culture technique for crop production appear to be limitless. It portends revolutionary developments in certain phases of agricultural production, a potential load for the electric utilities, a large consumer of electrical materials and also of chemical products, many of which today are by-products of the heavy chemical industries.

Goodwill Building + + +

["With public sentiment nothing can fail; without it nothing can succeed; consequently he who moulds public sentiment goes deeper than he who enacts statutes or pronounces decisions."—Lincoln.]

Sell Christmas Lighting In Advance

18 Let's have a campaign called "The Lighted Doorway" and let arrangements be made before the next Christmas season approaches, to make it easy for everyone to have a garland of electric lights over his doorway during the holiday period.

Several months in advance, certified salesmen, dealers or power company representatives could call on housewives and outline the plan to them, inquiring if they would like to have a quotation on the cost to install a couple of receptacles over the doorway. Later on, the dealers could make up garlands of lights, or other decorations, using different colored lamps, which could be sold, or possibly rented for, say, a two-weeks' period. If the garlands were rented they could be installed by the dealer and removed after a specified time.

This idea applies principally to those who have no front garden and therefore cannot have an outdoor Christmas tree; but there is nothing to prevent everyone from using the idea and having "A Lighted Doorway" during the holiday season, including homes, apartments, hotels, stores, public buildings, etc.

This leads to the suggestion that the wiring of new homes should provide for outdoor receptacles over the doorway or entrance, so that such garlands or other electrical decorations may be used.

Feelings of goodwill engendered during the holiday season are apt to last throughout the year.—*C. A. G.*

Public Is Anxious To Learn About Utilities

19 John Erskine has written a book entitled "Unfinished Business." An unforeseen automobile accident terminates the career of the main character, who leaves a lot of unfinished business. The story is based on the fanciful idea that this man is permitted to return to the land of the living, to tie up the loose ends, and to bring his business to a successful fruition.

Just how, one might well ask, is that fanciful story related to the public utility? Just what is there left of unfinished business that the industry need be seriously concerned about?

Is it the promotion of sales? The perfecting of distribution, metering, ac-

counting, or any one of the thousand adjuncts necessary to the operation of the utility? Or is it not more truly in the field of public relations?

In the January issue of the ELECTRICAL WEST, H. A. Lemmon of the Sierra Pacific Power Co. brings a serious charge against the utility, an indictment that has to do with wasted opportunities, an indictment justified perhaps because of the growing pains incident to the rapid rise of the utility to its present status of national importance.

The utility is definitely on the spot. Politicians and self-styled public spirited citizens have thrown down the gauntlet of war. The extent of their success is attested by the fact that a growing number of the voting population are looking with longing eyes toward that panacea for all ills, "government ownership."

The thinking voter wants facts and is not misled by political propaganda. But, and here lies the danger, the average voter does but little thinking. Too often mass hysteria controls the result of the ballot. Voters, like sheep, follow the loudest bugle and listen to the most vociferous talker.

Where has the utility fallen down? The answer is in their indifference to the very real necessity for creating goodwill among their customers. What is the first essential toward creating goodwill?

First, cards must be laid on the table. The maintenance and operation of the service corporation is of interest to the average customer and must be placed before him in terms he can understand. The field is ready. The Kiwanis, Exchange, Lions and many women's clubs will welcome, with open arms, speakers who have an interesting story to tell of the different phases of operation of the utility.

In the capacity of meter reader for one utility, I have had the unparalleled opportunity of meeting and talking to hundreds of our customers. My ears have been open to the trend of public opinion. Experience has shown me that people will instinctively distrust that which they do not understand. The creating of goodwill entails the enlightening of the customer on points that have always been a mystery. It is good psychology to recognize that a lack of understanding breeds suspicion, distrust and fear. The irritation may be and mostly is subconscious but it carries with it a most unpleasant kick-back.

Unlike the experience of Mr. Lemmon, I have found that the public is very much interested in the operation of the utility. They want to know about rate structures. They want to understand about the physical side of the industry. They want to know about horsepower and the kilowatt. They are interested in the number of employees and what they do. These and a thousand questions need explaining and the public is waiting to hear.

A short time ago I was asked to give an inter-departmental talk on a "know your company program." The talk was enthusiastically received. Apparently our left hand does not know what our right hand is doing.

From that humble beginning, the talk "Seeing Life With A Meter Reader" has been in demand by outside organizations and clubs. Its acceptance by the public has far surpassed wildest expectations. The customer is not only ready but is actually eager to hear stories of the operation of the utility.

There is hardly a phase of utility operation that cannot be dramatized and placed before the public. The medium to be used could be radio, the newspaper, the story pamphlet, or direct speaking to groups.

The different departments of the utility have excellent speaking talent. The development and use of this talent will return splendid dividends far in excess of the cost of sponsorship.

Courteous attention to consumers' complaints and the increase in operating efficiency are not alone the goal toward which the utility must travel. A whole world of "unfinished business" lies before us in the field of public relations. We do not have to wait for a reincarnation to start promoting goodwill. The opportunity is before us now and the need is great.—*A. W. C.*

Rules

TO intensify interest in the problem of building customer goodwill ELECTRICAL WEST will pay $2.50 for each idea or suggestion deemed worthy of publication. In addition all suggestions received during the period from November 1, 1935 to October 1, 1936, will be eligible for $50 in awards to be given by ELECTRICAL WEST, the P.C.E.A. and the Northwest Electric Light & Power Assn. These awards will be based upon the goodwill building merit of the idea, its practicability, adaptability and originality. The judges will be officers of the two associations and the editors. The awards will be $25, $15 and $10 for the three suggestions ranked first, second and third by the judges. In the case of ties duplicate awards will be made.

Suggestions should be limited to 400 words, preferably less. Composition does not matter as manuscripts will be edited for publication by the editors. Ideas will be published over a nom de plume, provided the author indicates that such is his or her wish. They should be sent to the editor.

A Motto on the Wall Means Nothing

20 In an obscure corner in an office of a large public service corporation is a small, neatly-framed sign which reads, "Our Motto: Good Service, Square Dealing and Courteous Treatment." Conscientious adherence to such a motto, would permanently eliminate the problem of goodwill building and Mrs. Thomas, a consumer of that corporation, would be a friend and booster rather than an advocate of public ownership.

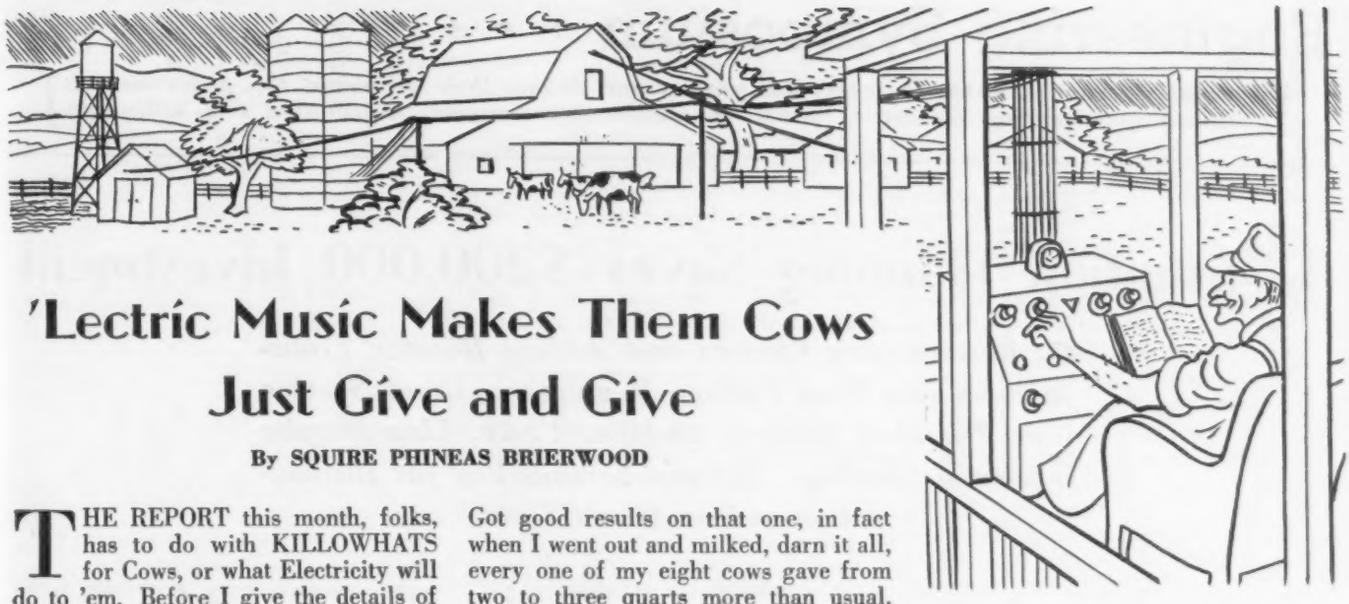
Mrs. Thomas is a bride of eight months, and a charming young lady just a few years out of college. Prior to her marriage she resided in a neighboring community, where at a prenuptial party, she received a beautiful automatic toaster. Being a lovely appliance it was immediately placed in service, with perfect results. After marriage, a change of residence was made and immediately the toaster failed to produce as perfect results as heretofore. Set at light, the toast was too light and dry. Adjusted to dark, the toast was light.

A phone call to a friend identified with the electrical industry brought the suggestion that perhaps her trouble was due to low voltage. Mrs. Thomas called at the office of the power company, explained her trouble to a clerk and requested a voltage test. The clerk, by impressive technical explanations, attempted to satisfy her that low voltage could not possibly be the trouble. Much confused, but still unconvinced, Mrs. Thomas went home.

Later, upon the suggestion of a friend, who guaranteed satisfaction, an electric range was installed in her kitchen. To serve the range, a transformer was installed on a pole in front of her house. Immediately her toaster returned to its original perfection and being an intelligent lady, Mrs. Thomas knows why.

The writer heard the story, was interested, and made a check of conditions. Mrs. Thomas was served from a secondary system 2,850 ft. in length, supplied by a 7½ kva. transformer located 1,659 ft. distant. In addition, fifteen other consumers including two ranges, were supplied from the same secondary system.

Minor complaints to a power company are often major complaints to a consumer, and here "Good Service," "Square Dealing" or "Courteous Treatment" would have made a friend.—*S. M. M.*



'Lectric Music Makes Them Cows Just Give and Give

By SQUIRE PHINEAS BRIERWOOD

THE REPORT this month, folks, has to do with KILLOWHATS for Cows, or what Electricity will do to 'em. Before I give the details of some of the results back here on the Farm, I would like to announce that the electric salesman said this would come under the department of ANIMAL HUSBANDRY. I told him at once that we didn't call 'em that up here, but he said maybe I didn't understand, but it was all in the family.

First of all he explained that cows had to be happy and contented. Asked him right away how could you tell when a cow was having a good time, and he told me by the amount of milk she gave. I replied if that was the case a couple of mine must have had a death in the family recently. The first thing he did was to string wires for electric lights all through the barn, explaining that if the cows could see just what was going on they would be more contented. He then hung up a HORN—called it a LOUD SPEAKER—and connected it with the phonograph in the house. Asked me what my favorite tune was. When I told him the ARKANSAS TRAVELER he said that tune probably wouldn't do as the cows might take a notion to wander. I told him Ma was a little partial to LEAD KINDLY LIGHT. He seemed to think that would be especially good in foggy weather. Alongside the HORN he hung one of those electric EYES. And then he rigged up what he said was the very latest in Electricity — an electric LISTENING EAR. All this was just Step number one.

Just before I went out to milk the next morning we tried out the Horn (all of us sitting around the kitchen table). I put my favorite on the phonograph and he watched the charts on the wall. Reported right away we had better take it off, the Ear sort of insinuating that the cows wanted more up-to-date music. I turned the record over then and softly played THE OLD OAKEN BUCKET. Got good results on that one, in fact when I went out and milked, darn it all, every one of my eight cows gave from two to three quarts more than usual. He then said that just as soon as we had the house all fixed and the radio in we could give them some high class stuff. Told him right away I ought to watch that pretty close for I reckoned that 1936 would be a big year in politics and if the cows got wind of the favoritism shown hogs they might feel sorry for themselves and quit, expecting to get something for nothing. Said that couldn't be done but I knew it.

The next thing he installed in the barn was a fan, run, of course by KILLOWHATS. Said he installed this in order to improve the AROMA. He went on to say that the smell of clover and timothy as it was sucked in from the hay mow would stimulate the cows' appetite, and eating more consequently would give more milk.

We now come to what should be called the HEAVY DUTY COW INSTALLATIONS. We Farmers back here in the Hollow have long been reconciled to get up at six on a wintry morning, twenty below more or less, shuffle out and do the milking. My grandfather, Ebenezer did it, my father, Ephraim Brierwood did it, and I have been doing it myself for many years. TODAY, however, thanks to KILLOWHATS, my milking is all done even before I get up and to this new ERA DEVELOPER—electricity—is responsible for it all. This is how it works. Each one of my cows has a stall to herself, individual feed trough automatically fed, and individual drinking bowl. To make the job even better he installed electric wires on the inside of each bowl and consequently the chill can always be taken off—in fact I could boil it if I wanted to.

The actual milking is done by a machine and this is how that works. He first bored two small holes in each stall, one on each side about 8 inches from the floor. Asked him right away what that was for. He explained that a clock controlled electric pokers and when it was six, these jabbers went to work. Then, as she got to her feet a board partition came up from the floor and shut off her hind legs from the bag. Said this was to prevent kicking. Attached to the partition were a number of hand-like contrivances made from some rubber product. As they sort of felt around and finally contacted the teats with a firm grasp, the milking machine in one corner started up. Of course you know the EYE was watching—really bossing the job—and the EAR was listening for any signs of distress. Well, the milk ran down through a small hole in the palm of the hand-like contraption right into the milking machine from which it passed down a glass tube and into the TUNNEL† below, flowing along and emptying into the bowl of the separator. The weight of the milk started that up, the cream passed into a jar and the skim milk, of course went right on to the pig house.

We didn't think the machine would work at first, thought it would freeze up but we put a few KILLOWHATS in and everything worked fine. Wish I had space to tell you what happened the first time we tried the machine on Marietta. We didn't know, of course, that she had cut one of her teats on a barbed wire fence—but the EYE spotted that. The fellow that said "the hand is quicker than the eye" never heard about this kind. Full financial report will be made later. See you all again soon. Next I'll tell you about "KILLOWHATS—at Work and at Play Around the Farm—OUTDOOR SECTION Number 1."

† Tunnel—Underground road I built from the house to the barn.

Engineering Symposium + + +

[A monthly forum in which engineers will present and discuss their problems, this department is dedicated to advancing the art of power generation, transmission, distribution and utilization]

Distribution Planning Saves $200,000 Investment

By Re-arranging Circuits and Adding Booster Transformers and Step Voltage Regulators, Good Service Was Provided Along a 48-Mile, 12-kv. Line Despite Increased Loading. Interest Savings Pay for Installation in One Year's Time

By H. H. MINOR
Distribution Engineer, San Joaquin Light and Power Corp., Fresno, Calif.

No. 2 of a series of articles by Mr. Minor in which he tells how engineering analysis of a problem in regulation resulted in obviating the need for a huge capital investment without sacrificing good standards of service.—The Editor.

The methods employed in arriving at the solution of a problem in distribution planning, having to do with maintaining satisfactory service to a rural load, may be of interest. In some ways it is typical of conditions often confronting the distribution engineer, while in other respects it is quite unusual. It is typical in that it involves a gradual load growth over a period of years, a growth that exceeded the original design of facilities to serve, with the result that the serving utility finally was faced with the necessity of making a large expenditure in order to properly care for the existing load, as well as to provide for new. It is unusual because of the extreme length of the distribution lines and the character of a major load at the extreme end of the distribution. Difficulty was added to its solution because of the mountainous country between this load and other available sources of supply.

The distribution line originally built to serve this load was constructed so it could eventually be cut over to 70 kv. but was operated at 12 kv. It was 24 miles long and served a scattered load of mixed residential and power service. The wire used was No. 4. The plan was that, when and if future business developed that would justify such a move, this line would be converted to 70 kv. and a substation located at its end.

For most of its length the feeder extends along the coast in a severe fog and salt spray area. Maintenance expense because of this, and also because of its length and isolated location proved very high. The location would have made operation at 70 kv. very difficult and expensive. In addition, it soon developed that the terminus of this line was not the logical location for a substation. Soon after this feeder was completed, arrangements were made to extend the service some 22 miles further along the coast to a large estate where a small diesel plant was operating. This extension was built, using 12,000-volt standard construction, of No. 4 wire. It traversed a territory with some possibility of future load, particularly near its end. The load growth was quite rapid, that at the estate far exceeding the amount originally contemplated. A small town and an adjoining vacation home development, as well as considerable agricultural and mining activity, all centering some forty miles from the supply end of the feeder, also contributed to load growth.

This new demand at the extreme end of such a long radial feeder made it necessary to provide more line capacity than was available from the original No. 4 circuit. A second feeder was constructed from the substation to the small town at which the first line built into the territory terminated. This second feeder was of No. 2 copper and was strung on the same poles as the other line for its entire length of 24 miles. The load within this 24-mile distance from the substation was connected to the original No. 4 circuit, and the extension beyond the 24-mile point was supplied by the new No. 2 feeder. This arrangement proved adequate for some time, but as the load continued to grow, service, from a voltage standpoint, became unsatisfactory for the loads on the new extension. This was accentuated due to the character of the load at the large estate situated some 46 miles from the substation. This load was practically all lighting and heating. It was equivalent to a fair-sized town in capacity, demands approaching 500 kv. finally developing. It differed from the usual diversified load, however, in that it was a quite common occurrence for this load to be practically all switched on at once. The result was a very pronounced sudden dip in voltage. This was particularly noticeable during the winter months when, in preparation for large numbers of week-end guests, all heating equipment would be used at once.

As a temporary measure, designed to care for low voltages and fluctuations resulting from the character and location of this large block of load, a regulator station was installed at a point 32 miles from the supplying substation. Two single phase induction type regulators, with 10 per cent raise and lower range, were used. The service to the load was thus improved and proved quite satisfactory for several years.

Realizing that in time this arrangement would not be satisfactory due to further increase of load, a 70-kv. substation was planned, to be located near the temporary regulator station. A 21-mile transmission line was to be constructed to supply this substation. This transmission line would traverse a very rugged, mountainous territory, heavily wooded. The cost of the line and substation would approximate $200,000. The expected happened, and increases in demands caused such a line drop at peaks that the 10 per cent boost range of the regulators was exceeded. General financial conditions were such that

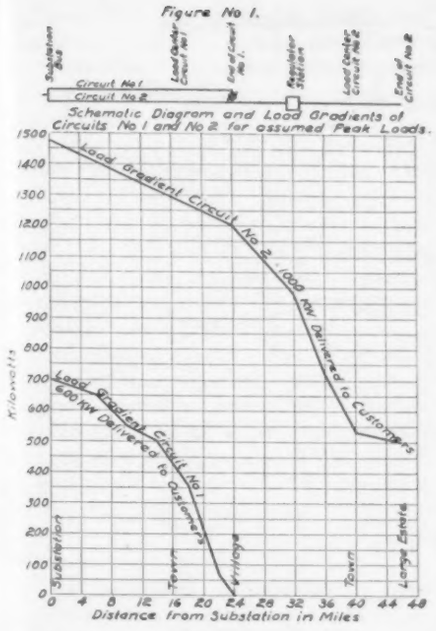


Figure No 1.
Substation No 4
Load Center Circuit No 1
End of Circuit No 1
Regulator Station
Load Center Circuit No 2
End of Circuit No 2
Circuit No 1
Circuit No 2
Schematic Diagram and Load Gradients of Circuits No 1 and No 2 for assumed Peak Loads.
Load Gradient Circuit No 2 - 1000 KW Delivered to Customers
Load Gradient Circuit No 1 - 600 KW Delivered to Customers
Kilowatts
Substation
Tenant
Orinda
Town
Large Estate
Distance from Substation in Miles

Fig. 1—Schematic diagram and load gradients of circuits No. 1 and No. 2, for assumed peak loads

the expenditure of the above amount to provide the substation and transmission line could not be justified. Some other solution was necessary, a solution that would provide adequate service, particularly from a voltage standpoint, and not prove so costly. Such was the problem to be solved.

The solution should be such that any permanent construction or addition to existing equipment would fit into the probable ultimate substation installation. Such equipment that might be of a temporary nature should be salvageable at small cost and readily usable elsewhere. Losses, maintenance charges and other expense items should be considered. The scheme that would provide adequate service for several years at the lowest ultimate cost should be chosen.

The first step in determining what should be done was to obtain a clear picture of the loads and demands as they existed, and from that data and estimates of probable load growth arrive at demands and probable consumption that might reasonably be expected in the future. It was advisable to consider not only the newer development at the extreme end of the territory being supplied, but also the load being served by the original No. 4 line. From a check of distribution transformers connected to these lines and from graphic records of loads being served, load gradients for each of the lines involved were plotted for an assumed ultimate load of 1600 kw., delivered to the customers. This total load was divided between the two feeders, 600 kw. being allotted to the 24-mile No. 4 feeder, and 1000 kw. to the longer line. These two feeders will be designated as No. 1 and No. 2, respectively. A schematic diagram of their location, together with the load gradients mentioned above, is shown in Fig. 1. These load gradients are as of the peak load contemplated for the two areas served by feeders No. 1 and No. 2, and include line losses and distribution transformer losses.

Fig. 2 is a representation of the voltage that would result on both these feeders under the assumed peak load and at probable minimum loads. The extreme fluctuation that might be expected at the end of line No. 2 is very conclusive proof that some remedial measures are necessary before the assumed loads can be served.

It will be noted from Figure No. 1, that at the peak load considered, the losses on feeder No. 2 amount to 48 per

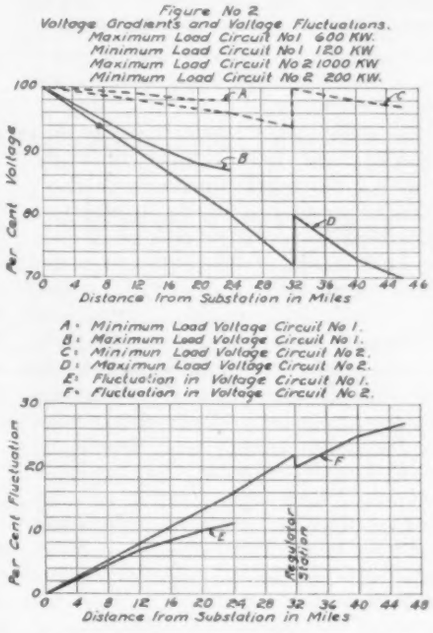


Figure No 2.
Voltage Gradients and Voltage Fluctuations.
Maximum Load Circuit No1 600 KW.
Minimum Load Circuit No1 120 KW.
Maximum Load Circuit No 2 1000 KW.
Minimum Load Circuit No 2 200 KW.
Per Cent Voltage
Distance from Substation in Miles
A: Minimum Load Voltage Circuit No 1.
B: Maximum Load Voltage Circuit No 1.
C: Minimum Load Voltage Circuit No 2.
D: Maximum Load Voltage Circuit No 2.
E: Fluctuation in Voltage Circuit No 1.
F: Fluctuation in Voltage Circuit No 2.
Per Cent Fluctuation
Regulator Station

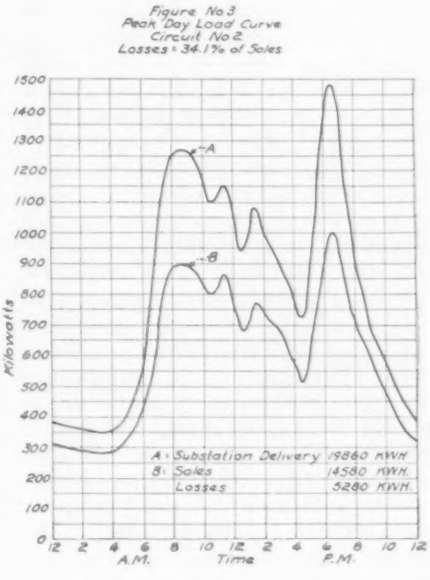
Fig. 2—Voltage gradients and Voltage Fluctuations

cent. At first glance this seems out of all reason. It means supplying 3 kw. to the feeder for every two sold. This, however, only occurs at the peak. Fig. 3 is a daily load curve as of the peak day, from which it is seen that the average losses for that day are 34 per cent. The average losses throughout the year will probably not exceed 25 per cent. If it is assumed that 10 per cent may be considered as normal distribution losses on a yearly basis, this line then will cause 15 per cent excess losses when serving the contemplated load. The cost of these excess losses, capitalized, should be added to the cost of any scheme that utilizes the present feeders to supply the expected loads, when comparison is made with other methods of serving them.

It was plainly evident that the first step, in order to utilize the present feeders, would be to supply such voltage at the present regulator station as would allow it to function within its rating and allow for line drop compensation for extremes of loads that might be expected. Therefore, Fig. 4 was constructed. It shows the voltage gradient for circuit No. 2 that would provide the voltage that should be available under maximum load conditions at the regulators, as well as the no load voltage that should be maintained. From these curves it is seen that the voltage supplied to this feeder at the substation must be fluctuated from 13,200 volts at no load to 15,000 volts at full load. Where these two curves cross, at a point fifteen miles from the substation, the voltage would be constant at 13,200 volts.

Such a condition could be readily obtained by the installation of regulating equipment, including a fixed boost, at the substation, with line drop compensation set to maintain constant voltage at 13,200 volts at the fifteen-mile point. Such equipment, however, would be special as to voltage rating and would not be as usable elsewhere if it became advisable to discontinue its use for the purpose considered here as would a standard rated piece of equipment. Further, at no place on feeder No. 2 would the voltage be such that it would be possible to tie that circuit to circuit No. 1 so as to carry part of its load in an emergency. Thus the area between the supplying substation and the present terminus of the No. 1 circuit would be dependent on that feeder alone.

Fig. 3—Peak day-load and loss curves for circuit No. 2; losses equivalent to 34.1 per cent of sales

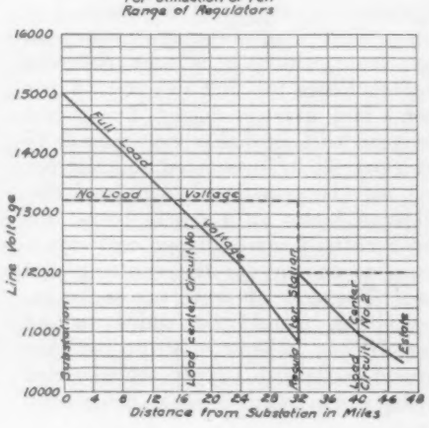


A more flexible arrangement, from an operating standpoint, and one that would utilize material readily salvageable and of such nature that it could be re-used at other locations on the system would be much better. Reference to Figure No. 1 shows that the load center of circuit No. 1 is seventeen miles from the substation. Therefore, it would be most advantageous to have an available source of supply, at correct voltage, at or near that point and separate from the circuit which normally feeds that load. The point of compensation shown in Fig. 4, or the place where the voltage on feeder No. 2 should be constant, is not far from this load center, but the voltage would not be correct if the scheme outlined above were adopted. If we assume normal feeder voltage of 12,000 volts on circuit No. 2, at or near that point we would then have to boost that voltage in order to supply correct voltage to the existing regulator station. If standard 6900/480-volt transformers were used connected for star boost, we would get 12,850 volts, approximately. That voltage at twenty miles from the substation would provide for the desired operation of the present regulators. Thus circuit No. 2 could be utilized to supply the load normally fed by circuit No. 1 by a switching arrangement tying these two feeders together on the low voltage side of this booster bank.

There remains the necessity of providing 12,000 volts constantly on circuit No. 2 at twenty miles from the substation. If at that point a standard 10 per cent raise-and-lower, step voltage regulator were installed, without compensation, the supply voltage could fluctuate at the regulator from approximately 10,800 volts at full load to 13,200 volts at no load. Referring to Fig. 4, it is seen that the full-load-voltage drop from the substation to the twenty-mile-point, at which this regulator would be installed, is 2,500 volts. Thus, in order to obtain the proper supply voltage at the substation, circuit No. 2 would have to be boosted to 13,500 volts, approximately, to result in 10,800 volts at the proposed regulator at full load. Approximately 1,500 volts boost can be readily obtained by using three standard 12,000 to 2400/480-volt transformers, so connected as to provide 960 volts on the secondary, and connecting the bank for delta-boost. By checking phase rotation this boost can be so arranged as to improve power factor on the feeder. This connection utilizes four of the five secondary coils of the transformers, connected series-parallel. Transformers of 100 kva. and of the voltage rating required are standard stock equipment. Three high voltage bushings are required, which is accomplished by installing an extra one in the handhole of the cover of the standard, cover-bushing type distribution transformer.

The above plan results in providing voltages that will come within the range of the regulator station already installed on circuit No. 2. It also provides regulated voltage at a point near the load center of the area being supplied by circuit No. 1. It utilizes equipment that is easily salvaged and is standard stock equipment. The voltage conditions that would result at the end of circuit No. 2, and at locations between the existing regulator station and the end of circuit No. 1, would not be satisfactory, however. For the latter load a feed back from the existing regulator station is necessary. Sufficient pole height is available to string a second circuit on the existing poles. Besides providing regulated voltage for the small load along the eight miles of its length this feed back provides a second possible source of regulated voltage for picking up part of the load now served from circuit No. 1. Service to the customers at the end of circuit No. 1 would be improved if they were normally supplied from that feed back.

Fig. 4—Voltage gradients for circuit No. 2, utilizing full range of regulators



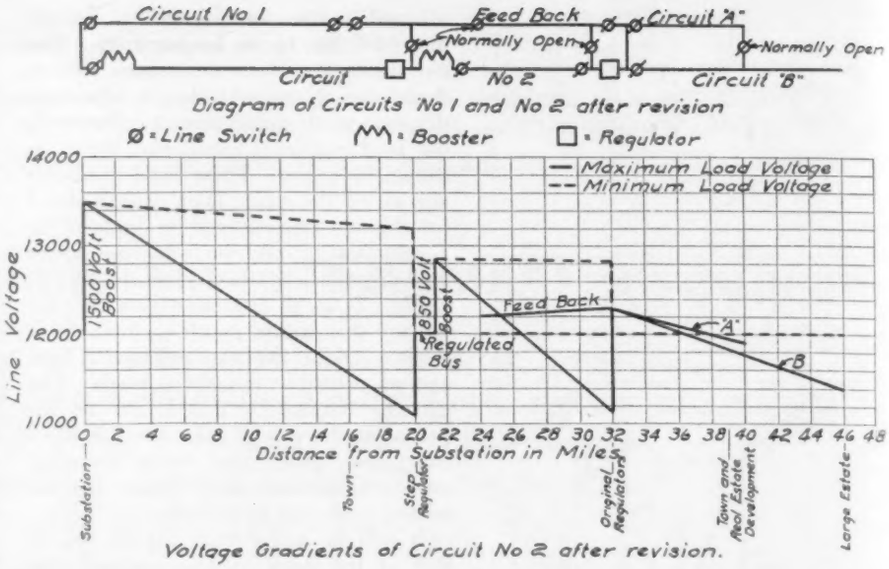


Fig. 5—Diagram of circuits No. 1 and No. 2, and voltage gradients of circuit No. 2, both after revision

The load beyond the present regulator station consists of two major groups as shown in Fig. 1. These are the large estate, with a demand of some 500 kw. at a distance of fourteen miles from the regulator station, and the real estate subdivision and other load, centering some seven miles from that station. Building a second feeder on the existing poles for that seven miles will allow of serving each of these load groups by separate feeders from the regulator station. As both groups are predominantly domestic in character, that is, residential service, except for some agricultural pumping and mining load in the latter group, their daily characteristics are somewhat similar and therefore compensation can be resorted to at the regulator station to provide approximately uniform voltage near the real estate subdivision and a reasonable voltage range at the other load.

Fig. 5 is a representation of the results to be expected from a voltage standpoint from the installation described. It also shows the revised feeder layout. Reasonably good service is provided for the whole area supplied by these two very long feeders. It also affords such duplication of feed to much of the load served by circuit No. 1 as can be given with a parallel feeder on the same pole line. By means of field switching, in cases of emergency the total load in the area can be served by circuit No. 2, or certain sections of circuit No. 1 can be energized

from No. 2. Also, by proper field switching, in the event of failure of circuit No. 2 between the two regulator stations its load may be picked up by circuit No. 1.

The total cost of this arrangement will be approximately $31,000. Additional losses, over another plan that might supply power to the area affected, would capitalize at $2,000, thus bringing the total cost for comparison purposes to $33,000. Of this cost some $18,000 is due to the additional line building included in the plan outlined. This or a similar line construction program would be required for any other plan that would supply power to this area at one point only. Thus the actual expenditure that will be necessary in this case that would be obviated if some other plan were adopted is approximately $15,000.

The method of providing suitable service to the whole area under consideration, described above, would result in voltage conditions just as good as would the formerly proposed transmission line and substation. From an operating and maintenance standpoint it presents no greater difficulty. In fact a substation supplied by a radial transmission line across a mountainous region would probably be more subject to trouble than would the regulated distribution lines proposed. From a cost standpoint, as pointed out above, the additional investment including capitalized excess losses for the distribution plan outlined is only $15,000, while the cost of the substation and transmission would require an outlay of some $200,000. In eighteen months, interest alone on this sum would pay for the entire regulating plan, under the assumption that the same added distribution line facilities would be required for both schemes.

Other methods of correcting the faulty service that has resulted from load growth in the area being considered were investigated. They included the installation of a diesel engine generating plant in lieu of the transmission line and substation; moving a synchronous condenser from another location where it is not greatly needed; providing additional copper to care for the voltage drops encountered, and operating circuit No. 1 as a transmission line as was originally planned. None of these even approached in economy the plan outlined above, nor would they provide more satisfactory service. Therefore it was decided to adopt the regulated distribution line scheme.

As was stated at the start, this problem is typical of conditions encountered in rural distribution in some respects and unusual in others. It illustrates, however, how careful distribution planning may at times obviate or delay for a long time a large capital outlay and still provide adequate service to rural loads, even under the most adverse conditions.

▼

Engineering Testing Aided by High Speed Motion Picture Camera

THE high speed motion picture camera has been found to be a most helpful tool in the practical research and testing operations conducted by some utilities. The multitude of items of equipment required for the growing complexity of electrical service in all its phases together with the numerous manufacturers offering each item are responsible for the growing need of laboratory investigations and reports. The utility testing laboratory has come to be recognized as a means of saving money, improving the design of existing equipment, and developing new ideas for improving service.

The Bureau of Tests and Inspection of the Pacific Gas and Electric Co. is one of the large utility laboratories, having a wide scope of activities, where the high speed motion picture camera has been adapted to eliminate guesswork in observations made at engineering tests and to obtain visual records of performance.

A picture of the equipment now used at this laboratory is shown mounted on the tripod. It consists of:

One No. 70D Bell and Howell 16 m.m. camera operating at 8, 12, 16, 24, 32, 48 and 64 frames per second.

One Cooke F3.5 Universal lens.

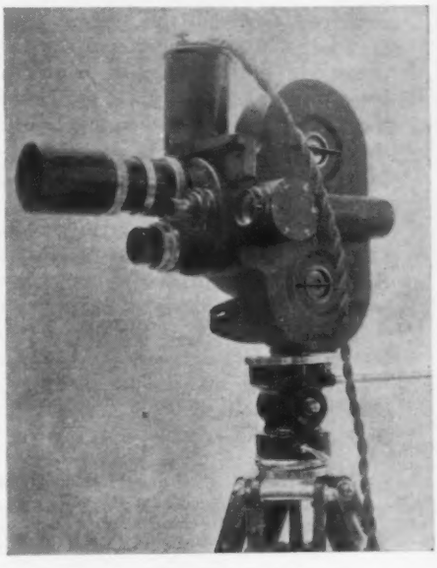
One Cooke F1.5 1-in. lens.

One Cooke F3.5 3¾-in. telephoto lens.

These lenses are mounted on the turret head. A Bell & Howell photometer is used as an exposure meter.

Upon the camera is seen a cylindrical case mounted with two wires attached to terminals. This is a solenoid for operating the starter button from a distance. It gives remote control of the camera so that it may be placed near the apparatus under test. This is particularly advantageous on certain types of tests from a safety standpoint.

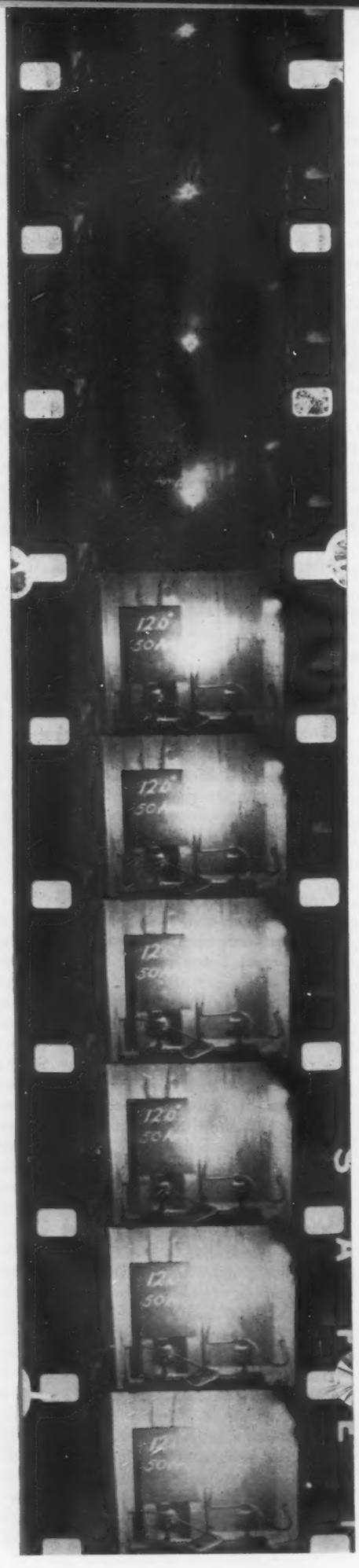
The first test to which the high speed motion picture camera was applied was to obtain visual records of fusible cutouts interrupting a circuit. Fusible cutouts have been tested since their use began and undoubtedly will continue as long as they are used, but it was only a few years ago that the high speed motion picture camera was utilized to determine certain phenomena about their operation.



The camera for the first test was rented and when the pictures were viewed it immediately proved such an aid in analyzing test results that the equipment listed in the foregoing was purchased.

In actual practice, the motion picture camera and the oscillograph are started a short time before the circuit breaker energizing the fuse circuit closes and both are continued in operation until the circuit is interrupted either by the fuse or circuit breaker. Thus a complete visual record of the action of the fuse together with an electrical oscillographic record is obtained.

Motion picture records obtained in this way are then run through a projector one frame at a time so that a progressive picture of conditions of the interruptions are obtained. As the camera records the picture 64 frames per second, it is possible this way to record a complete detail of conditions which existed for but a few cycles. As shown in the accompanying illustration of a fuse interrupting a circuit, a particularly important detail registered on the film was the formation and movement of the ball of luminous conducting vapors generated by heavily overloaded fuses. This gaseous body of conducting gases passing between an energizing conduc-



Slow motion photograph of the dissipation of an arc on a horn gap. Studies enabled the determination of correct angle between horns

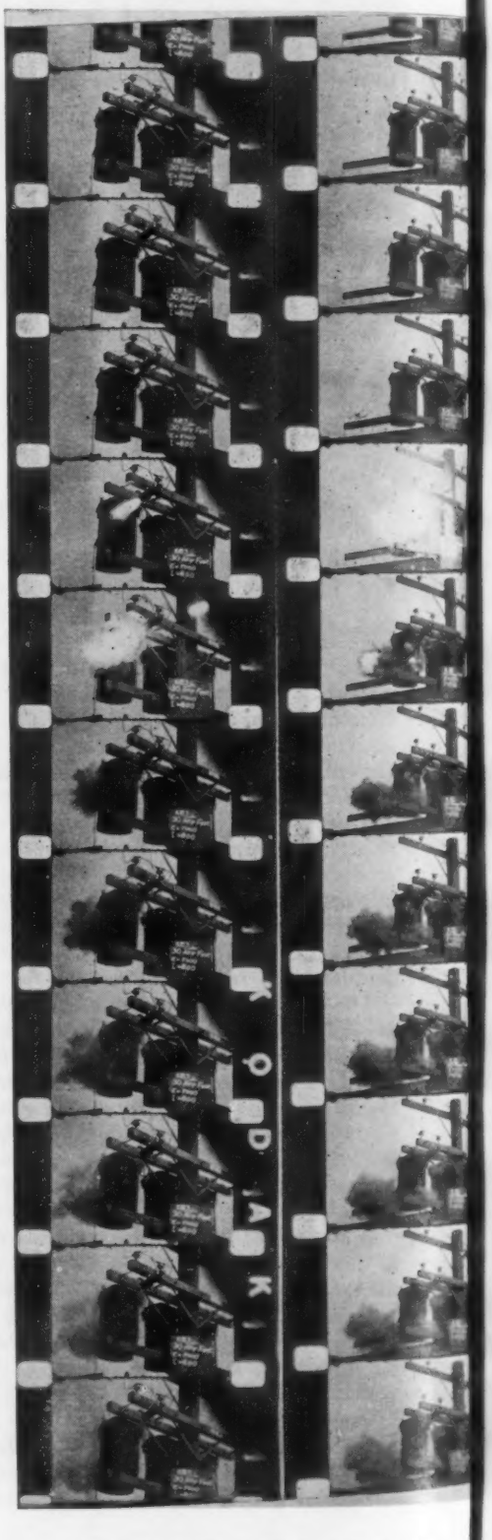
tor and ground might very easily initiate an arc which would be the direct result of the fuse trying to clear a faulty circuit.

The motion picture record of the tests on various fuses results in obtaining much actual data which, together with the associated oscillographic records, permits recommendations for the modification of design of fuses to obtain the best operating results.

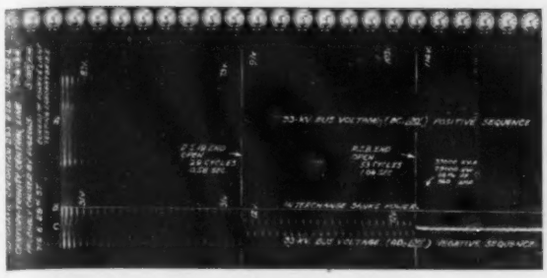
MOTION PICTURE RECORD OF METER READING

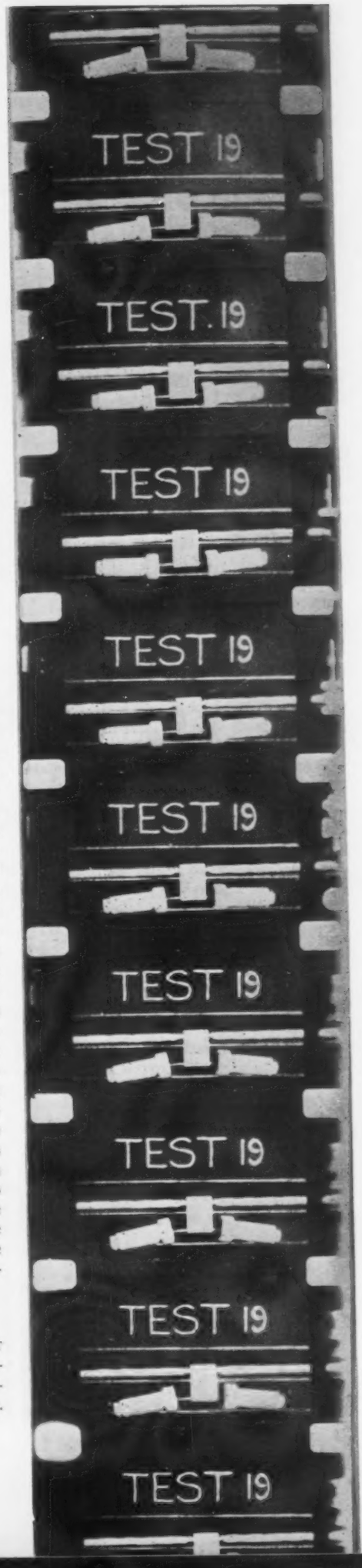
Having successfully applied the use of the high speed motion picture camera to record fuse tests other practical uses were soon found for the instrument. One of the most interesting of these is the ability of the motion picture camera to take meter readings at any desired rate per second. This is particularly valuable in obtaining data in dynamic electrical situations such as the testing of load pickup of generators and where a simultaneous record is desired of several rapidly changing metered or observed quantities. Illustrative of this technique is the test which was made at Station A of the Pacific Gas and Electric Co. to determine the operating characteristics of the 61,000-kw. compound high pressure unit installed therein. In the load dump test one unit was loaded to 61,000 kw. and the other unit adjusted to carry a load of possibly 10,000 kw. At a predetermined time the loaded unit was tripped off the line and the second unit allowed to absorb the dumped load. Under these conditions, which might occur in actual practice, it was desired to know the exact conditions on the system and in the plant. For example, steam pressure, boiler water level, steam and water flow in the boilers together with system frequency and the voltage and the speed of the tripped out unit were to be obtained. While all of these quantities were metered on the plant switchboard, the fact that the test took place in less than 10 sec. made it impossible to obtain instrument readings in any other way but that of photographing the meter board with the motion picture camera running at 8 frames per second. After a film record had been obtained, which record consisted of approximately 100 ft. of film, the film was projected on a large screen one frame at a time and the instrument readings recorded and charted on curves. From these data the complete record of the internal and external conditions at the plant was calculated with very little difficulty. A passing interest is the fact that the system was able to absorb the load dropped by the 61,000-kw. turbine without abnormal voltage or frequency fluctuation and the unloaded turbine itself dropped some 50,000 kw. of load without exceeding the emergency speed limit.

This technique of obtaining such data will find wide application in all forms



Two "shots" of the operation of a 5-kv. fuse. Studies like these facilitate investigations leading to improved designs





Left — Photographic record of the combination of the automatic oscillograph film and a motion picture film of a clock taken for several seconds after the fault had initiated the operation both of the oscillograph and a motion picture camera. All information including time of fault, duration, time of clearing trouble and data on currents and voltages is permanently recorded by stripping the two films together and making a print of the cimbination

Right—Section of the film of a motion picture study of damper operation used to minimize conductor vibration

of dynamic testing, particularly where conditions change rapidly. The motion picture camera not only provides a rapid method of reading meters during changes which occur in a few cycles but also provides a permanent record of the tests on the film negatives.

VIBRATION STUDIES

In the study of vibrating conductors and the effect of dampers the high speed motion picture camera was found to be a valuable aid. Its ability to make a record of conditions of 64 views per second and to show the relationship between two or more moving objects was put to good advantage in this investigation. The high speed motion picture study was taken to obtain the relative motion between the wire and the damper and to obtain the amplitude of the vibration at various frequencies. The accompanying photograph shows a series of pictures taken with an experimental 15-lb. damper operating on a vibration of approximately 8 cycles per sec. The amplitudes of the vibrations were obtained by projecting the pictures full size upon a screen, stopping the projector at the desired frame and measuring the amplitude with respect to the reference line which will be noted in the background.

TOWER STRAIN STUDIES

Still another adaptation of high speed motion picture technique is its use to study the effect of the breakage of conductors. In this connection a steel tower line was cleared and rigged as it would have been in service and the strain on one conductor released at a predetermined time. A continuous record of the motion picture camera obtained an accurate record of the deflection from which stresses in the tower could easily be calculated.

INVESTIGATING HORN GAP SETTINGS

A very productive use to which the high speed motion picture camera was put was the determination of the most efficient angle for the horn gap of protective equipment. In this study horn gaps arranged at various angles were set up and each subjected to the same circuit conditions. The high speed motion picture camera was set to watch the formation of the arc at the base of the gap, its progress upward and final dissipation off the outer tip of the horn. The behavior of the arc under various conditions was revealed in a most illuminating fashion by a slow speed projection of the films thus obtained. It is interesting to note that a horn gap with an angle of 13 deg. proved to be the most satisfactory.

TIMING OSCILLOGRAPH OPERATIONS

Another novel use to which the motion picture camera has been adapted is that of recording the actual time of automatic oscillograph operations as exemplified by the technique employed by the Los Angeles Bureau of Power and Light. This utility has several automatic oscillographs installed at strategic points on the system and desired to obtain the exact time and length of duration of the faults recorded by the oscillographs. A spare motion picture camera was arranged as shown in the accompanying photograph to photograph the face of an electric clock. The relay circuit which initiates the automatic oscillograph operations also energizes the solenoid on the motion picture camera which starts it running at the same time the oscillograph is started. The negative obtained from the motion picture camera is syncronized and printed with the negative from the automatic oscillograph as shown in above. In this way it was possible to obtain both complete records of circuit conditions existing during the fault and the exact time at which the fault started and was cleared, all of the data being available for the system engineers on one photograph.

CONCLUSION

Undoubtedly there are many other applications in which the motion picture camera has proven to be of material assistance to operating engineers.

The few that are mentioned here are indicative of the wide field of utility. Laboratories that have used it for research and investigation are enthusiastic about its possibilities and prophesy a widespread adoption of the technique or variations thereof described in this article. The motion picture camera is portable, economical in operation, easy to operate and provides a permanent record of phenomena which is complete, accurate and capable of being studied at leisure.

Two engineers who are enthusiastic about the use of the high speed motion picture camera in engineering work are Mr. M. O. Bolser, Bureau of Power and Light, Los Angeles, and Mr. G. Leslie Hill, Bureau of Tests and Inspections, Pacific Gas and Electric Co. Both have pioneered the use of the camera in their respective organizations.

•

Conveyer Speeds Service In Waiterless Restaurant

A restaurant without waiters yet one where food is brought to the customers and used dishes removed speedily and silently is the latest idea in modern catering. Completely electrified, this newest restaurant of Boise, Idaho, is known as the Mechanafe and it has met with the instant popularity of the citizens of Boise because it provides fast service and an unlimited quantity and variety of food selection for its patrons.

In operation a continuous driving chain travels within a glass-enclosed runway, moving longitudinally through the center of the long room up a shaft and back along the center of the upper floor of the restaurant. Driven by the chain are 137 steel carts, each of which carries a conventional-sized serving tray. These carts are loaded with all items of the menu in the kitchen, travel through the restaurant where patrons make a selection as they pass by their seats, and back into the kitchen where the carts are refilled.

As the customers finish with their dishes, a small aperture at each place can be opened and the dishes placed on a traveling belt that carries them into the kitchen. In the kitchen every appliance is run by electricity as are all of the traveling serving belts. In addition to this a trolley is carried around the runway and trays of hot dishes are kept hot during the trip by means of 1,500-watt heaters in the top of the metal carts. A sliding contact on each cart providing the necessary supply of energy from the bare trolley wire.

This new restaurant, built by the Automatic Food Machinery Corp., Boise, Idaho, greatly simplifies restaurant operation and has the further advantage of reducing operating costs from the fact that much of the labor cost is eliminated by the arrangement of electrically-driven serving mechanism. By charging a flat rate and providing a wide variety of food displayed on the trays for personal selection by the patrons, public acceptance is assured. From the electrical standpoint, this load, representing approximately 30 kw. connected, has a very high load factor, as much of the equipment operates continuously.

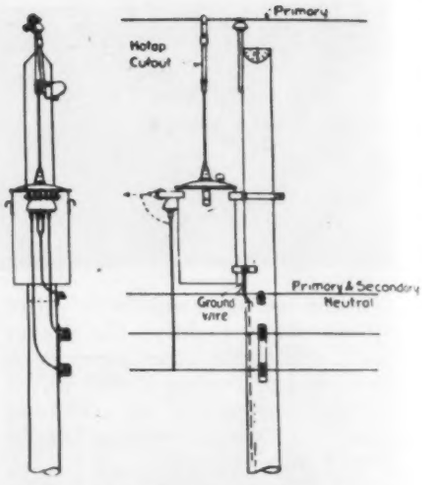
•

New Rural Transformer Simplifies Installation

Developed to reduce the first cost of rural circuits, a new transformer is now being manufactured by the Wolff Electric Works, Inc. of Portland, Oregon. The new design incorporates a strap-iron bracket, circular in shape, which permits mounting directly on a pole without the need for a crossarm, as shown in the accompanying illustration.

A secondary rack, welded to the transformer tank, enables secondary circuits to be deadended directly on the transformer. Production schedules have been under way for several months on orders received from various parts of the Northwest territory.

B. L. Wolff is president of the enterprise. Associated with him is H. C. Miller, formerly of the Utah Power and Light Co. and the Pacific Gas and Electric Co. The company, in addition to its manufacturing activities, will continue its established business in electrical repairing.



Method of hanging rural line transformer without crossarm

•

Left — Heated trays leave kitchen. Interior view showing vertical lift for tray conveyor at the right

. . . Book Reviews

PHENOMENA IN HIGH FREQUENCY SYSTEMS, by August Hund, Consulting engineer. 642 pages; 6 x 9 in.; Fabricoid bound; illustrated. Price $6.00. Published by the McGraw-Hill Book Co., Inc. For Sale by the Mc-Graw-Hill Retail Room, 883 Mission St., San Francisco, Calif.—This book, one of the International Series in Physics, is an advanced work combining experiment and theory in analysing phenomena in high frequency systems and presenting this data with many applications to problems arising in communication engineering. The contents are ably handled and cover the subject in an excellent manner. The book should be a valuable reference for teachers and advanced students as well as research workers in commercial fields.

•

RADIO ENGINEERING HANDBOOK—Edited by Kieth Henney. Fabricoid bound; 4¼ x 7 in.; 849 pages; illustrated. Published by the McGraw-Hill Book Co. For sale by the McGraw-Hill Retail Room, 883 Mission St., San Francisco, Calif. Price $5.00.

This is the second edition of the Handbook made necessary by the rapid development in the radio art since 1933. Over 300 pages of new material has been added, including an entirely new chapter on antennas, completely revised material on television and a complete description of new tubes, circuits and concepts in the radio field. Both the theory and practical operations of radio design, manufacturing and current practice are included in this book.

•

MERCURY ARC RECTIFIER PRACTICE, by Frederick Charles Orchard; published by the Instruments Publishing Co., 1117 Wolfendale St., Pittsburgh, Pa. Price $5. This book is designed for plant operating and construction engineers to give fundamental theory of both glass and steel mercury arc rectifier design and their commercial applications. Chapters deal with the construction of the rectifier plant, the operation of mercury arc rectifier substations, testing, maintenance and control of these devices. European and American practice are included in this book which should be a valuable help to system engineers.

Cooperation on Parade + + +

[*Forecast of forthcoming cooperative merchandising activities, and review of activities in progress or completed, a summary of cooperation at work throughout the West*]

Dealers, Utility Launch Water Heater Drive

ELECTRICAL appliance dealers, wholesalers and plumbers are being urged to participate in a 90-day water heating activity sponsored by the Utah Power & Light Co. which runs until the middle of July. In inviting the dealers and plumbers to participate, it is pointed out that the need for hot water service is universal, that it will open an outlet for modernizing old kitchens and complete electric kitchens in new homes and that customers who have previously purchased ranges or refrigerators or automatic coal stokers are perfect prospects for hot water heaters.

Under arrangements with the utility an offer is made to install a water heater for $5, which includes both wiring and plumbing. In order to obtain this offer dealers have their contracts signed by purchasers and the down payment made, notify the company store or division headquarters and the company delivery truck picks up the water heater from the dealer's store and installs it and bills the dealer only $5 for the service. Since this represents only a small proportion of the actual cost of installation, it is felt it will prove a real incentive to the sale of this appliance.

Another real selling help is a 60-day trial offer. The dealer sells on his regular contract requesting $5 and regular monthly payments. If at the end of 60 days the customer decides the service is not what he wants he is given the privilege of returning the heater and is entitled to refund by the dealer of his payments. Suggestion is made that this be followed in this campaign, since on previous trials of similar offers it has proved the benefits of electric water heating service and has resulted in practically no reverts.

The campaign encourages all types of electric water heaters. Utah Power & Light Co. lists only two heaters which it sells itself, Hotpoint and A. & F. water heaters of 40-gal. capacity. All heaters are required to be of 40-gal. or larger capacity, factory built, equipped with a 1,500-watt top unit and a 1,000-watt lower unit, both thermostatically controlled. Fifty-gal. heaters will also be acceptable, but 30-gal. heaters will not come under the terms of the low installation price offer, since the company considers this storage capacity insufficient to give adequate customer service.

Hail The Laundry Home Maids!
I'm Miss ELECTRIC WASHER—
At laundry work I'm fine.
In just the fraction of a day
I've got it on the line.
And I'm ELECTRIC IRONER—
My method it is fun.
While you'd get scarcely
Turned around,
I've got the labor done.
. . . they'll banish
WASHDAY GLOOM
Every woman should have in her home a modern ELECTRIC WASHER and an equally modern ELECTRIC IRONER. And nearly every woman can have...if only she realizes how these two faithful electric servants can more than pay their way in the saving of wear and tear on clothes...to say nothing of the priceless blessing of lightened labor, better health, happier and longer living.
Visit your electric appliance dealer this week. Don't go to buy...but just to see. Learn how marvelously quiet, simple in operation and how thoroughly efficient is the ELECTRIC WASHER of today. And how smoothly, surely and quickly the ELECTRIC IRONER can do nearly all of the ironing.
Discover, too, how low in cost they are—and on what easy terms you can buy them.
See Your Electrical Appliance Dealer!
Sponsored by
W. H. Bintz Co.
Leland B. Flint Co.
General Elec. Supply Corp.
The Salt Lake Hardware Company
George A. Lowe Company
Stovall-Peterson Hardware Co.
Greybar Electric Co.
Utah Power & Light Co.
Western Supply Co.
Westinghouse Electric Supply Co.
Z. C. M. I. Wholesale

These home laundry maids furnished the keynote in a series of newspaper ads in a cooperative washing and ironing machine promotion campaign undertaken by dealers and the Utah Power & Light Co. The campaign also employed local radio broadcasts and tied in with the national broadcasts of the American Association of Washing Machine Manufacturers

Recent surveys in Salt Lake City show the average cost for operation to be 10 cents per day under the company's schedule 71 for controlled storage electric water heating service effective in all territory served by the company. A $1 per month minimum charge also entitles the customer to use 75 kw.-hr. during the month and for additional consumption the rate is 1 cent per kw.-hr.

An extensive advertising campaign of 40-in. ads will appear in Salt Lake, Provo and Ogden papers throughout May, June and July, to which dealers are urged to tie in with product ads of their own.

•

Electrify the Industry Is Slogan of Sales Drive

When 250 employees of southern California wholesalers together with their wives listened to the complete story of electric cookery in the auditorium of the Southern California Edison Co. in Los Angeles on April 27, an intensive drive aimed at electrifying the industry was launched by the Electrical Development League. The carefully conceived program is the outgrowth of a suggestion offered by Ross Hartley, president of the Electric Corp., at the last meeting of the electrical wholesalers at Del Monte. Ultimately employees of firms in every branch of the industry will hear the story and will be urged to "use electrical products themselves."

Electrical cookery was chosen initially so as to clarify much of the misunderstanding and lack of knowledge on the part of "electrical wives" who are not familiar with the remarkable strides of electric cookery and its manifold advantages. Even though they are not in a position to purchase and use a range, it is hoped that they will become boosters for this modern method of food preparation.

The program which has been devised to sell the industry on its own products —in this case, the electric range—included the best available talent. The self-interest side of the story was presented by Ross Hartley. Three home economists gave actual demonstrations to prove the advantages of electric cookery and to dispel popular fallacies. These included actual preparation of food and a demonstration of "Miracle Cookery" in which a complete meal was cooked on a range which had been wrapped in cellophane. C. H. Williard of Hotpoint summed up the advantages and explained the special terms and prices which have been made available to industry employees by the manufacturers, distributors and wholesalers. The Edison company talking motion picture in color, "Dinner for Eight," was also shown. Entertainment was provided by the Los Angeles Bureau of Power & Light quartet. Models of many makes of ranges were on display with cards

showing the prices at which they could be purchased.

Experience with this program will be used for the preparation of a standardized presentation which will be used at future meetings. A schedule of such meetings is being prepared which will ultimately cover every branch of the industry in the South.

Invitations to the meetings are sent to the wives. In addition the employers themselves call attention of the employees to its importance. Return postcards indicating acceptance are addressed to the employer.

●

Kitchen Service Offered to Pepco Customers

Portland General Electric Co. now offers its customers the services of the Pepco Kitchen Planning Bureau. Advice in planning of the ideal kitchen for any individual customer is provided. The Bureau is to be in charge of "Jane Martin," a trademark name for the supervisor who will have charge of the work. A radio program will support and publicize this service to the public.

An adjunct to the kitchen bureau will be ingenious, visual demonstrations of the food savings and money savings possible by the intelligent use of electric kitchen facilities. For example, batches of cookies made at home in the electric oven will be compared in quantity and cost to purchased cookies from the stores. Tests of the comparative goodness of each will also be offered the visitor to the kitchen bureau. Amounts of mineral-filled juices which are wasted in the cooking of vegetables will be visually demonstrated also. In fact, all of the sales points of electric cookery and electric refrigeration and electric dishwashing will be dramatized, according to Orr Crites, merchandise sales manager of Pepco.

●

• San Jose Exposition—A more elaborate electrical exposition than those previously held in San Jose by the Electrical Development League of Santa Clara County opened the new San Jose municipal auditorium with the first show of its kind in that building April 21-24. Since this occurred at time of going to press, details of the show will be carried in a later issue. About 20 dealers in Santa Clara County entered displays and the Pacific Gas and Electric Co. provided Mrs. A. V. Farnsworth, home economist. Entertainment featured a 44-piece symphony orchestra.

●

• Electric Appliance Society has had another chapter formed recently in the Colgate division of the Pacific Gas and Electric Co., at which fifteen charter members signed up.

Dealers and contractors at a meeting in Santa Rosa, Calif., where Better Light-Better Sight is being explained and demonstrated by (left) L. G. Gianini and (right) W. E. Carlson

Educational Lighting Programs Reach Thousands

Better Light-Better Sight penetrates the consciousness of thousands of residents north of San Francisco Bay as being not only a slogan, but a logical suggestion of real benefit, as the result of an intensive educational campaign undertaken jointly by the incandescent lamp department of the General Electric Co. and the Pacific Gas & Electric Co. W. E. Carlson of General Electric and A. L. Walker, division sales manager for P. G. & E. are the men who conceived the educational idea.

With geographical and time concentration as a first principle, and the attempt to enthuse people about modern lighting as an aim, Messrs. Walker and Carlson mapped out a series of educational programs. Assembling a collection of new lighting units, including lumiline, bowl-silvered and high intensity mercury vapor lamps as exhibits, they worked out a program which presented modern lighting in its application, technical problems and benefits.

Mr. Carlson personally scheduled, and gave talks, at 23 meetings through which more than 5,000 persons were reached. At meetings with dealers, L. G. Gianini spoke on technical phases of new lighting developments. Dealer groups, clubs and schools were the audiences. Enthusiasm over the programs, and reports of increased light-unit sales were the results.

Presentations were made at San Rafael, Sausalito, Tamalpais Kentfield, Sonoma, Healdsburg, Petaluma, Santa Rosa and Sebastopol schools; to service clubs in San Rafael, Sausalito, Mill Valley and Healdsburg; to dealer-contractor groups in San Rafael and Santa Rosa, and to sales forces and other employees of the Pacific Gas & Electric Co., in the territory.

●

• Bonus—In line with other groups taking advantage of the veterans "bonus" situation, the Bureau of Radio and Electrical Appliances of San Diego County directed its advertising to the attention of San Diego County veterans suggesting electrical appliances, and especially refrigerators, for purchase with bonus money. Large advertisements in each of the local papers, most of which were in two colors, ran during the past month, and reproductions of the advertisements were used on heavy cards in window displays and store displays by dealers in San Diego.

●

• Late—Although announcements and material for the national Electrical Housekeeping Month arrived so late in the West that advantage could not be taken of the promotion, a number of displays were utilized throughout the West in April. The Housekeeping Month was the first of this year's promotional programs on a national scale to be inaugurated by the Edison Electric Institute. The next such campaign will be one on June bride gifts and for Mother's Day gifts in May and June. Later in the year other such promotions will also be announced.

●

• Semi-Annual Market at the Western Furniture Exchange, San Francisco, will be held Aug. 3 to 8. Sponsored by exhibiting factories, the Market will include among its separate events the Western Radio and Appliance Show and lamp showings.

ELECTRICAL WEST COOPERATIVE

SALES APPLIANCE ★ GUIDE

WATER HEATERS

MAY, 1936

. . . . Copyright, 1936, by Electrical West, 883 Mission St., San Francisco

Preparation Pays Dividends in Better Sales

Water Heaters Require More Thought of Your Customer's Needs

THOSE who sell water heaters profitably have learned that they require a little more thinking and planning than the ordinary run of appliances. People just do not come in and order them off the shelves. But dealers can sell them with profit if they and their salesmen use just ordinary good sense and a little thought as to the specific needs of the individual customer. There is one supreme thing to remember—

Always sell a water heater of sufficient capacity to serve the needs of the family. Too small a heater will only bring a train of grief that will more than eat up all the profit.

Therefore, to get profit and commissions, to gain satisfied customers who will recommend you, prepare yourself by giving thought to the suggestions on this and the other pages of the Sales Guide. Use the sales points on page 4 of this guide to meet the obstacles as Bill Smith, the master salesman, does. Get ready by getting informed on—

Rates—

Each utility has its own special rates for water heating. They are all favorable and make your selling easy. Be wise and learn what they are, how to apply, what type of heaters the utility recommends and what the wiring arrangements are. Most utilities have very low rates, some on off-peak, some on other special metering or load limiting arrangements. Find out what these are. They are simple and valuable to understand.

Water Conditions—

Water in one locality is not the same water as that in another. Some water is exceedingly pure, which has a tendency to absorb the metal of ordinary tanks and shorten their life. Other water is hard, and deposits or "limes" up a tank quickly. Find out from your utility what the water conditions are in your own town. It may be different in the next town. But remember that the utility has had to investigate all these factors. The information is yours for the asking.

Wiring—

Many utilities offer special wiring inducements. Find out if these apply to your customers and how they apply. A few simple rules or conditions to observe will save trouble and bring satisfaction to you and your customer.

FROM THE CUSTOMER

Having obtained such general information from the utility, you will need specific information from your customer too. Some of the questions will require tact and good judgement. But in the interests of closing a really satisfactory deal to both you and your customer you should make diplomatic inquiries to get information as to—

. . *BATHS* . .
etc.

One gallon of 150 deg. water equals two gal. usable hot water. Hotter tank temperatures hasten "liming."

Figure out the maximum day's use, with everybody using his full quota.

Allow from 15 to 18 gal. per day for adults. For children from infancy to six years, about the same as adults. From six to 14 about 8 to 10 gal. From 14 on up, as much if not a bit more than adults.

The average bath takes about 15 gals, 10 gals at 150 deg., the balance cold. But some like deep baths—30 gal., or long showers, 30 to 50 gal. Size of bath tubs is also a factor.

Servants take double the adult quota—25 gal. Chinese waste more, at least use 35 gal.

It's wise to figure 15 gal. to each extra bedroom, also bath room.

Extra showers should take about 15 more. Washday, where laundry is done at home requires about 6 more gal. per day per person.

Add the total for the people in the house and get your maximum gal. required for any day. Then be sure to provide a heater with enough storage to more than meet that peak day. Remember, once hot water is available the chances are more will be used.

Number of Persons—

in the family. Each person uses hot water when it is available. Find out too, how many are adults, children, servants, and whether the servants are Chinese. Then apply the hints in the table on this page.

Bathing Habits—

of these people. Some like showers, some like to soak. Some like them oftener, some like them deeper. While these questions may seem to be unduly curious, when you explain that such habits influence the amount of water that will be needed and help decide on a tank of safe capacity the information will be given freely.

Home Laundry—

Sometimes the extent of home laundering, and its frequency, and at least just what time it is started in the morning in relation to baths, is important information. Sometimes it doesn't matter.

THE HOUSE ITSELF

Next it is mighty important to know something about the house that the water heater is to serve, along the following lines—

Water Outlets—

Count the hot water taps in the house, including baths, basins, wash trays, sink, and shower heads. Also get an idea of the size of the bath tubs. Find out if there are any unusual or abnormal uses of hot water.

Piping and Location—

Try to get an idea of the length of hot water pipe in the building, and of its size, whether it is covered or uncovered, what kind of insulated covering is used, if any. Also find out whether the taps fed by uncovered pipe are frequently used or not. Also find out if the water heating piping is a circulating or non-circulating system.

SALES TALKS THAT

CASE HISTORY NO. 18

Selling an Electric Water Heater

EVEN the critical and fact-minded person, Bill Smith has found from experience, can be sold best by emphasizing and re-emphasizing what the appliance will do for his comfort and convenience. And water heaters, Bill Smith has also found, must be sold to the man as well as the woman of the house. Often the husband finds that a good salesman, like Bill, has just about sold his wife on an electric water heater. But if he is mechanically inclined that same husband will want to have his say as to whether the particular water heater meets his own ideas as to efficiency, construction, and operating characteristics. He wants to be shown. Mr. Bates, in this case history, even though he has put off doing it as long as possible, just as a matter of principle, has finally promised his wife to go in and talk to Bill Smith today. He is not in the easiest frame of mind to sell, Bill notices, and will need convincing proof of every point. Nor will he overlook any mechanical or operating detail. Therefore Bill quickly decides to convert every mechanical detail into a money saving, a convenience, or a health bringing feature. Notice how he handles a few of these challenges.

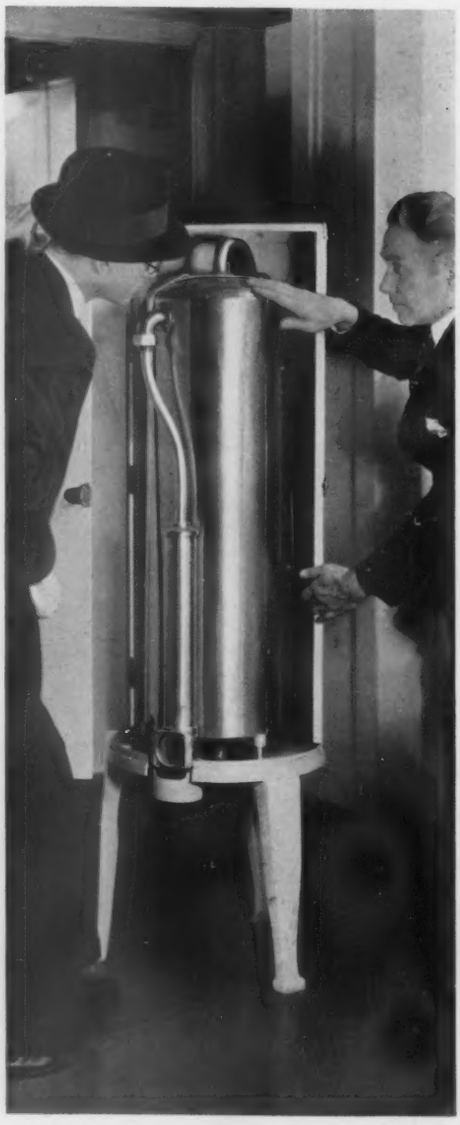
* * *

BILL: *(After Mr. Bates has introduced himself and told the purpose of his visit rather bluntly)* "It is mighty nice of you to come in, Mr. Bates, and we appreciate it. I'm sure it will repay your interest for now we can both go over every detail to your complete satisfaction. A man like you, Mr. Bates, who really takes the interest and the time to investigate the quality of his home equipment is a real asset to any family. And we certainly want to satisfy you in every respect that the health protection that comes from an adequate and dependable supply of hot water, the convenience of having it automatically ready every time you need it—never too hot, never too cold—the real ultimate economy of electric water heating, and the peace of mind that is priceless, are all that we told Mrs. Bates they were."

MR. BATES: *(impatiently)* "Skip it. Let's have a look at this heater you were talking about. I haven't much time."

NOT much cue from that remark as to what line of attack to make, so Bill decides to waste no words; make every word count.

BILL: "This attractively finished and adequately sized electric water heater here is the one Mrs. Bates and I were discussing. As I recall, it would fit into your kitchen and really enhance its already modern appearance. That's because it is mighty easy to look at with its straight, simple lines. Once installed, you will never know it is there for it does its job of providing you with all the hot water service you need without a sound or a thought. It has all the silent, clean efficiency of electricity."



MR. BATES: "Yes, I know, but how does it work?"

BILL: "I'm glad you asked that, Mr. Bates, because if you will step over here to this cut-away model, you will see what a simple, sturdy and reliable device this water heater is. Now naturally you want to get every cent's worth of use and convenience out of the electricity used to provide your water heating needs. Notice this space for efficient, heat-saving insulation, that keeps the warmth in the water and not out into the air. Notice, too, the special long-life tank of monel metal *(bronze or heavy galvanizing as the case may be)* that insures dependability for years, and assures you of that peace of mind which comes from absolute reliability. This heater will deliver hot water, day in and day out, year upon year, without so much as a match, a thought, or a concern. That's where electricity is worth so much to you—in its silent, clean, absolute bother-proof dependability.

NOTICE how Bill has converted two or three mechanical features into indispensable services to the purchaser. He might have wandered off into discussions of the merits of one kind of metal as against another, or one kind of insulation against another, thereby running the risk of arousing in the already reluctant Mr. Bates, excuses on which to hang reasons for not buying. When a prospect is hunting reasons for not buying he magnifies into a big obstacle any detail that the salesman may drop. So Bill keeps talking advantages and benefits. There is no arguing on the desirability of these.

Sold APPLIANCES

MR. BATES: "Looks all right, I guess. There's not much to it, just a tank and some heating elements." *(Another non-committal remark that gives Bill very little cue.)*

BILL: "No, there's isn't much to it mechanically, but that's an advantage, don't you think? There *is* so much to it, however, in the service it gives, and that is what you really want isn't it? I can see from your interest that you have a real appreciation of mechanical construction. You must feel as I often do that there is something extra fine in a device or machine that does its job with fewer parts, fewer gadgets, less to get out of adjustment, and therefore with more reliability. After all the job of a water heater is to bring you automatically, without a thought or a preparation or a wait, all the hot water you and your family want, when they want it, night or day, in sickness or in health—and at just the right temperature. You want neither waste of fuel nor of water. If it can do this at the same time that it gives you a low operating cost on the special water heating rates, saves on plumbing expense and enhances the value of your home with modern equipment, then it represents a real asset to your home. As an article that is unobtrusively attractive in your kitchen, or completely out of sight out of mind if you want to locate it in a closet, basement or anywhere else, it means complete adjustment to your own requirements, doesn't it? And if it saves your time, your attention, your wife's labor, then certainly it is something you will take pride in owning and joy in using."

BILL has summed up as many of the sales points of his heater as he could muster into one big drive so that from among all of them, Mr. Bates must be affected by at least a few. When a prospect gives no clue to work on, you have to give him "the works," and Bill in that last statement did just that. It did loosen Mr. Bates up a bit, for he gave Bill an opening on the one thing that he was still undecided upon.

MR. BATES: "What you say may be true enough. We have hot water now, but it is provided by a coil in my furnace. I have to stoke it, it is true, but we have to heat the house anyway, so we don't mind that. Our only problem comes in summer, when the furnace isn't on. We have a little heater that we light up for that, and as far as I'm concerned it is sufficient. Mrs. Bates has other ideas."

BILL: "I don't blame you for feeling that you have sufficient equipment on hand now, Mr. Bates. You certainly have plenty. It really boils itself down to the point of whether you are getting what you are already paying for in real hot water service. The experience of many of my satisfied customers backs up those tests which were made by Massachusetts Institute of Technology. These showed that heat is heat, and that if you heat water in your furnace you have to use about 20 per cent of your fuel to heat the water. So you see you aren't getting your hot water for nothing by any means. Besides, the water in the furnace is then stored in a bare, uninsulated tank, and you lose again from the heat that radiates from the tank and piping system, whereas with this electric water heater, located near the kitchen sink, where so much of the water is used, there is no lost heat. What you pay for is delivered at the faucet."

MR. BATES: "But I have to pay for it in electric rates, and they are higher than other fuels."

BILL: "Higher? Yes, I can see how it may appear so, but isn't it a matter of the units used to measure the cost, Mr. Bates, rather than actual cost? Now you pay for coal at so much per ton, a large unit. You buy it in advance, have to store it, and do a lot of work to use it and clean up afterward. With electricity you only pay after you have used it, need give storage no thought, never have to spend a moment cleaning up. Yet with all this in its favor, dollar for dollar your water heating will not cost you much, if any more, if you will segregate your costs and properly distribute them on your budget. Then it is only fair to add in the savings in your time and effort, the savings in heat lost through inefficient water heating methods, long piping, an uninsulated tank. When you add the savings because of the longer life of electric equipment, the slower depreciation, the added home value, the safety, and the lessened waste of water, the books balance up well in favor of electric water heating. And then too, Mr. Bates, your summer problem would be solved."

MR. BATES: *(The business-like analysis of costs that Bill has just made has reached him)* I suppose so."

BILL: *(deciding to ask for the order)* Why not get the summer hot water situation off your mind now before summer gets here, and while you are beginning to ease off on the furnace even now. We will have your heater installed neatly and without the least inconvenience to you before the week is out. For your shave in the morning, you'll have hot water all through summer. For dishes, for laundering, for all the uses she has for hot water, Mrs. Bates will have the peace of mind that comes with an automatic supply of water of just the right temperature. For the family in summer, warm baths and clean clothes aplenty, no matter how hard the playing, how dusty or sweaty the outdoor play makes them. You'll be glad you did it a thousand times. How about it, Mr. Bates?"

MR. BATES: *(after a moment's thought)* "Oh, all right. It ought to make everybody happy. When can we draw the first bath?"

SINCE Bill had already figured out with Mrs. Bates the family requirements as to number of baths, persons in the family and other conditions which every good salesman of water heaters should know in order to prescribe the right size of tank, etc., he could and did write up the order right then and there.

CALIFORNIA OREGON POWER CO. * PORTLAND GENERAL ELECTRIC CO.
MOUNTAIN STATES POWER CO. * PUGET SOUND POWER & LIGHT CO.
PACIFIC POWER & LIGHT CO. * IDAHO POWER CO.
NORTHWESTERN ELECTRIC CO. * WASHINGTON WATER POWER CO.
UTAH POWER & LIGHT CO.

All manufacturers provide attractive display material such as that at left. Tie in on their advertising by using these attention arresting posters

Hot water, of itself, has little appeal. But what hot water *WILL DO* for a family to make its work easier, and its health better, is something of vital interest to every person. Therefore place all your selling emphasis on these points. Use your mechanical features to prove that they can be delivered, and your manufacturer's reputation as a guarantee of service and quality. But keep hammering home these points:

Health—

Cleanliness is next to Godliness. Hot water makes it easy to keep clean. Warm baths are luxurious necessities today. They cleanse, stimulate, soothe, and help ward off diseases. Clothes washed in hot water are better sterilized. Dishes washed in hot water are cleaner and more sterile. Housecleaning with hot water kills germs. Beauticians advocate warm water for care of the skin. Hot water, physicians agree, both externally and internally, is one of nature's most effective means of preserving health. Children bathe without grumbling in warm water. It is easier for them to keep clean after hard play out of doors. What a blessing is instantaneous hot water in the middle of night if a child or anyone in the family is ill.

Luxury—

Even kings and queens cannot get more satisfaction out of the luxury of a warm bath than any ordinary person. The luxury of not having to wait for water to heat in order to shave, to bathe, to clean, is worth many times the cost.

Clean—

Cleanest of all methods for providing hot water is the electric way. Electric water heating ends the drudgery of soot, smoke, ashes and fuel storage. As superior to other methods as the electric light is to lanterns. Clean, too, because its use keeps the home tidy and its people healthy.

Modern—

Modern living requires an endless supply of running water, hot and cold. By actual count there are more than 30 distinct uses for hot water every day in the average home. Dozens of disagreeable tasks are eliminated or alleviated with hot water. The electric way to provide hot water is the way of today and the future. An investment in electric equipment can be safely made with the assurance of abundant fuel supply at ever decreasing costs far into the future.

Peace of Mind—

Day in and day out, night and day, whether a person is at home to watch it or not, the electric watchmen (the thermostats) keep the tank full of water of just the right temperature. There is nothing to turn on or off, to light, watch, remember, worry over, or hurry back home to see if it has been turned off. The peace of mind that comes with electric water heating is priceless.

Safety—

Safest of all means to provide hot water is the electric way. Never affected by failure of water supply, by accidental turning off of the fuel supply, stoppage of pipes, freezing, or neglect. No internal pressure can possibly be present because thermostats are positive in action and are set well below the boiling point, above which steam is generated. Can be installed anywhere, without regard to air supply or flues.

Time and Labor Saving—

Not alone in time saved waiting for water to heat, but in performing household tasks by the use of hot instead of cold water is time saved—and labor, too. Hot water dissolves sticky food particles on floors, makes removal of children's finger marks on woodwork easy. Hastens cooking when water at 150 deg. is used to start cooking rather than waiting to heat cold water.

Dependable—

Just as one learned to rely on electric lights, he can rely on an electric water heater. No more "tank patting," checking up to see if it is on the job; no wondering if there will be enough hot water for extra demands, like wash day or a house full of guests. It is always there, and never talks back.

Portable—

Can be moved from one house to another as easily as any piece of household furniture, so that renters can enjoy the services of automatic hot water as well as the home owner.

Truly Economical—

With special water heating rates electric water heating is truly economical. It permits quantity use of water at low cost. It prevents waste of water and of heat since with insulated tank (and piping) heat is retained in the water. No need to waste water waiting for it to heat up. Every bit of electricity put in is converted into heat. Depreciation on equipment is less, giving longer life. It requires no flue or flue repair. Also saves plumbing expense.

Enhances Home Value—

Gives prestige of modernity to the home. Increases its real estate value. Lowers its insurance risk.

Satisfaction of Having Best—

There is a certain social prestige to having the best and most modern. There is real pride in ownership of an electric water heater. If it is on view in a kitchen, with modern styling it gives a distinct appearance of up-to-dateness to the home.

•

One of these time saving, idea suggesting Sales Guides appears in these columns of ELECTRICAL WEST *each month. Next issue will feature sales ideas for Electric Cookers and Roasters.*

Year Round Promotion Benefits Northwest Dealers

Dealers in the Northwest previously have estimated that progressive load-building programs undertaken by the Puget Sound Power and Light Co. carried dealer benefits. But results of a serious Better Light-Better Sight campaign begun by the company in 1935, now replace conjecture with evidence in revealing two significant facts concerning home lighting.

One is that it can be sold the year 'round. The other is that dealers reap benefits. Dealers sold practically all of the lighting built up by a three-month campaign undertaken in summer-time, 1935, and yielding the following results:

Wattage added	233,519
Revenue added	$5,227
Direct Selling Expense	$4,182
Cost of revenue added	$.80 per $1 revenue
Wattage per adviser day	346
Wattage added per demonstration	190

Continuing the drive, Puget Sound Power & Light now has twelve highly trained girls in the field following a definite program under a capable supervisor. Their service is available free to any customer. Health through efficient lighting and the importance of eye conservation are emphasized. Augmenting home contacts is promotion through such organizations as Parent-Teachers' associations, women's clubs, etc.

Comprehensive advertising paves the way for customer calls. Performance of individual advisers is carefully checked on a progress chart, with stress laid on fairness and accuracy in measuring wattage and revenue results. General supervision is under C. T. Bakeman, while Miss Eva Kirkwood is in immediate charge of the home service girls.

•

Hockenbeamer Trophy Won by Coast Valleys Division

COAST Valleys division of the Pacific Gas and Electric Co. won the 1935 A. F. Hockenbeamer sales trophy with the Shasta division finishing in second place and losing by only one point. The Drum division in third place was only one point behind Shasta, providing the closest sales race between divisions of Pacific Gas and Electric Co. ever recorded in this annual event. Only eleven points existed between the winner and the lowest division in the race. Coast Valleys division was the winner for the second consecutive time by this contest. Division Manager Tom Snell and Division Sales Manager Phil George were congratulated by Vice-President in Charge of Sales R. E. Fisher as well as by the management on the sales showing.

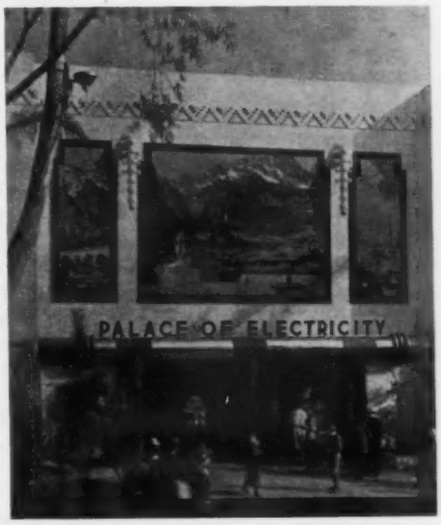
Consistently F. W. Paul, of Coast Valleys division, was awarded the "President's Award" for the greatest contribution to the load building program of the company in turning in "pink slip prospects" in the division managers' business-building campaign. He was awarded a gold watch for this achievement.

Since two other divisions have won the trophy two times, and as the trophy won three times by any division is retained by it permanently, the race for the prize this year is expected to be especially hot.

In announcing this award, it was pointed out that 316,350 major gas and electric appliances were purchased by customers in P. G. and E. territory in 1935. This was 28 per cent better than 1934 and represented a retail value of over $22,000,000, of which over 95 per cent was sold by dealers in the territory. FHA closed with a tremendous sales drive, over $1,000,000 worth of gas and electric appliances were sold during the month of February, an all time record.

•

Encore



Formally opened on March 15 was the new Palace of Electricity at the San Diego Exposition. Although early in the year, attendance has been gratifying and is improving every day. Exhibits, while not complete, are fast taking shape and additional features are planned in the future. The exhibits, however, are on a par with anything in the fair and are attracting as fine attendance as any building on the grounds

•

• REFRIGERATORS had a show all of their own last month in Salt Lake City. Individual dealers were among those exhibiting, carrying announcement of their exhibits in their own advertising. The event was held in the Salisbury Building.

B. C. League Shows Progress for Year

Close cooperation with wiring contractors, notable increase in number of electrical outlets per home and improvement in appliance sales by dealers were significant milestones of progress reported for 1935 by R. Hall, secretary-manager of the Electrical Service League of British Columbia. Mr. Hall's report was submitted at the league's annual meeting in Vancouver.

Cooperation given the league by the Vancouver Electrical Association was emphasized. The association is an organization of wiring contractors. In reporting increased numbers of outlets installed per residence, it was pointed out that wiring jobs placed by the central station through the League with members of the Vancouver Electrical Association had totalled $15,830.54 during 1935.

Many homemakers' courses, at which electric cooking, lighting, refrigeration and other problems of modern housekeeping were explained, were among the projects the League cooperated in sponsoring. Similarly, the League cooperated in several rural cooking schools and participated actively in the Better Light-Better Sight campaign.

Despite little residential building in Vancouver last year, residential wiring moved ahead, according to the report. Of 191 homes valued at more than $2,000 and erected during the year, Red Seal certificates were issued to 81, another to a five-suite apartment block, and 15 certificates are still pending. These figures represent a 53.2 percentage of Red Seal wiring in the class of homes specified, a gain of 56.3 per cent over the same figure for 1934. Outlets in these Red Seal homes averaged 61.8.

In addition to Red Seal certified homes, 746 additional outlets were installed as the result of 1,240 calls by League field representatives, and wiring plans supplied for 107 new homes.

Grand total of Red Seal homes in the Greater Vancouver area is now 4,167, comprising 2,654 private residences, 38 duplex residences (76 homes), and 1,437 suites in 94 apartment blocks.

For commercial lighting, equally encouraging results were reported attained. League efforts resulted in selling approximately $3,700 worth of lamps, fixtures and wiring. In addition, prospective purchases resulting from calls made by the League's representatives are estimated at approximately $11,285. Each demonstration with lighting kit was responsible for an average sale of wiring and merchandise to the value of $8.

Record of the commercial lighting

fieldman's activities during the 11 months this work was carried on shows 487 kit demonstrations were made on 1,139 calls. Results: 71 trial installations, sale of merchandise valued at $3,697.85; submission of 84 lighting plans; added load per call, 123 watts; added load per demonstration, 291 watts, and merchandise sold per demonstration, approximately $8. Prospective sales in this section have been logged at approximately $11,280.

Residential lighting campaigns during 1935 were waged with renewed vigor, resulting in immediate sales of portable lamps, wiring and fixtures totalling approximately $2,340, with prospective business estimated at $8,000.

Owing to lack of funds the League did not sponsor the usual decorative lighting contest last Christmas, and a decline in the amount of work of this type resulted. It is the hope of the League that this activity may be revived this year.

The 1936 program of the League decided on by the annual meeting will follow closely along the lines so successful last year. General educational work, residential wiring promotion, residential lighting, commercial lighting, and industrial promotion work, all are included in the program. It is also hoped to sponsor a model home depicting the latest trend in electrical home comforts.

W. G. Murrin, president, British Columbia Electric Railway Co., is president of the League, with George R. Wright, district manager, Canadian General Electric Co., as honorary treasurer, and James Lightbody, publicity manager, B. C. Electric Railway Co., as honorary secretary. R. Hall was reappointed secretary-manager. The executive committee of the League comprises E. E. Walker, sales engineer, B. C. Electric Railway Co., J. R. Read, district branch manager, Canadian Westinghouse Co., J. F. Little, G. R. Wright, J. H. Willard, J. Lightbody and George Horsman.

•

• A KITCHEN MODERNIZING BUREAU to tie in with the national activity has been announced by G. B. Buck, regional director for Colorado, Wyoming and New Mexico, as having started in Denver. This bureau is divided into subcommittees directly interested in various types of promotion involved. J. T. Coatsworth, representing the Electric Institute of Denver, will serve as chairman of the Bureau. F. R. Jamison will head the advertising committee; J. M. Eakins and A. R. Woolley the electric range committee; E. D. Davis and H. L. Percy the electric refrigeration committee; P. A. Douden and E. M. Rowland the electric housewares committee; G. O. Hodgson and K. L. Francis the lighting committee, and D. D. Sturgeon and J. J. Cooper the wiring committee.

•

Home Water Supplies To Provide New Load

To develop a big potential market for electric pumps in Utah, the Utah Power & Light Co. will mail to each person in its territory, whose home is not equipped with running water, a booklet entitled "Life in the Country." Prepared by the Electric Water Systems Council of Chicago, the illustrated booklet outlines the advantages of running water, contrasting in pictures rural homes operating with pressure systems and with hand pumps.

The action follows an investigation by the Dealer Coordination Department in cooperation with the Running Water Council, which disclosed that 4,700 homes in the district were without running water. Names of these home owners have been given jobbers, manufacturers and dealers.

Displays are being planned for stores, and salesmen instructed to "talk up" the running water idea. The pump program is expected also to stimulate the rural appliance field.

•

Sectional Sales Meetings Show Results in North

Refrigerator sales in Oregon and Washington are going strong. This report of the F. B. Connelly Co. of Seattle, Portland and Spokane, was released through W. R. McCurdy, general sales manager, who, accompanied by Manager R. O. Driesbach of the Connelly Acceptance Corp., has just completed a series of sectional sales meetings which introduced the 1936 Grunow refrigerators to more than 400 dealers.

Purchases this season have averaged better than a carload a day, Mr. McCurdy said. To meet the demand, F. B. Connelly Co. placed the largest initial order in its history, with the General Household Utilities Co., for more than 35 carloads. Divisional sales presentations were so successful that the company proposes to follow in the territory with the Connelly display coach carrying complete lines for dealers.

•

• SIXTY CARLOADS of electrical appliances is the quota set for dealers and the Pacific Power & Light Co. in its 3-month load building campaign that started April 1, according to Guy E. Davis, merchandise manager. The quota for dealer and company sales calls for 2,320 refrigerators (40 freight cars); 1,310 washers (13 freight cars); 700 ranges (9 freight cars); 550 water heaters (4 freight cars); 350 vacuum cleaners (1 freight car); 170 ironers (1 freight car); 160 domestic water systems and 12 dishwashers.

•

• FIVE DEALERS in Bingham, Utah, recently jointly sponsored a Modern Homes Laundry school, displaying washers and ironers. All models were displayed in booths similarly decorated in cool colors, blue and white. Smoothly run off, the school included lectures and demonstrations of soaps for washing, awarding of prizes for use in home laundering, as well as demonstrations of the appliance. Participating were The Miner's Merc., Bingham Radio Shop, Utah Power & Light Co., Bingham Mer., and West Furniture Co.

•

• AMERICAN HOME ECONOMICS ASSOCIATION is staging its annual exposition this year at the Olympic Hotel in Seattle July 6-9, 1936, according to announcement made by Keturah Balwin, business manager. Various industries contributing to home improvement are being contacted for exhibits at this exposition.

Spanish Architecture Banishes Austerity

The often forbidding appearance of the place where the bills are paid is eliminated in this new district office of the Central Arizona Light & Power Co., at Glendale, Ariz. Flanking the arched, flagstone patio are two display rooms which permit exhibition of an entire model kitchen or dining room. Cost, $15,000

"New American" Homes Displayed Throughout the West

THROUGHOUT America the "New American Homes" are on display. This goes for the West as well, for throughout the eleven Western states homes built to the prize winning designs of the architectural contest conducted by General Electric Co. have been completed and are being exhibited to crowds of people.

A list of the cities in the West in which these homes are exhibited would read like a railroad time table. Suffice to say that in all of the larger towns and in many rural areas such homes have been built by local builders with the cooperation of the General Electric Co.

Particular interest attaches to the home erected by J. M. Walker for Mason-McDuffie Co. at Berkeley View Terrace, Berkeley, Calif., built to the design of John Ekin Dinwiddie, a San Francisco architect. Mr. Dinwiddie won one of the second prizes in the national architectural contest and it was of particular interest to have his home design used for a home built near his own vicinity.

Reception of the home was typical of that in each instance. In the words of M. G. Read, sales manager of Mason-McDuffie Co., Inc., "We feel that the reception which the public has given the 'New American Home' in Berkeley is nothing short of sensational. As you undoubtedly saw by the newspapers, we had over 4,500 people through the house on the opening Sunday, in spite of the rain. That, so far as we know, is a record, but a record which was broken just seven days later when we jammed over 5,000 people through it. . . . Never in our nearly 50 years of experience have we offered a model home that has created as much interest or excited as much favorable comment as has this house."

Mr. Dinwiddie's prize winning plan was chosen by Mr. Walker, according to Mr. Read, because he was successful in surrounding an ideal floor plan with a most attractive exterior. The home is in a modern type of design with no ornamentation that is not also useful. It was fully equipped with an electric

With Helen Hughes Dulany, nationally known stylist visiting the "New American Home" at Berkeley, were one of the prize winning architects, John E. Dinwiddie, left, whose designs were used in the building of the home; A. W. Thompson, chairman of the G. E. "New American Home" committee, and M. G. Read, sales manager of Mason-McDuffie Co., Inc., realtors

Ground breaking for the first New American Home in Los Angeles was attended by a distinguished company. Left to right were Walter Braunschweiger, president, Chamber of Commerce, Los Angeles; a salesman for the Janss Corp., developers of Westwood; Fred Todt, manager, G. E. Supply, Los Angeles; H. Roy Kelley, A.I.A., member by Jury of Awards of the G. E. competition; Dr. Edwin Janss, Janss Investment Corp.; Fred F. Marlow, regional director, F.H.A., for southern California, with the shovel; George Belsey, George Belsey Co., G.E. distributors; Arthur R. Hutchason, Los Angeles architect and one of the winners of the award, and George M. Holstein, Jr., builder of this New American Home

kitchen, laundry and air conditioning system as well as having Red Seal wiring.

Stopping over in San Francisco en route to the East, Mrs. Helen Hughes Dulany, nationally known designer and stylist, inspected the home. She praised Architect Dinwiddie for "creating such a very fine example of modern architecture and utilizing to the full every advantage of the setting." Mrs. Dulany, by the way, is a daughter of George Hughes, pioneer of the electric range, and is herself stylist for a number of nationally known products, electrical and otherwise.

George Belsey Co., Ltd., of Los Angeles, likewise, opened several New American Homes in southern California. It was noted that of the 53 prize winners in the General Electric contest 7 of these came from southern California. Wherever possible designs from these architects were used in the building of the several homes in that region.

Altogether it has been felt by the industry that the promotion of the New American Homes has advanced electrification of American homes a big step forward. The contest itself stimulating the interest of the architects has solved one of the long standing problems of the industry, namely, that of acquainting architects with the benefits which accrue from a fully modern electrical home. This work, it is felt, will redound to the benefit of the entire industry.

•

Dealer Coordination Enters Third Year

With a record of continuous expansion of dealer business since its establishment, the dealer coordination department of the Utah Power & Light Co. has rounded the second anniversary mark. L. E. Baldwin, director of the cooperative program, plans intensification of the department's activities toward the single objective: "Sell More Electric Merchandise."

He will attempt to learn the wishes of all electric merchants in the territory, and then undertake to promote a uniform execution of their accepted plans. Mr. Baldwin's efforts since the inception of the department, in 1934, have been toward harmony in the industry. Dealers volume since 1934 has jumped to an estimated total of $5,300,000 in sales.

Drive for Potential Iron Sales in Utah

MAY in the region of Utah will be Automatic Electric Iron Month. A cooperative activity involving wholesalers, dealers and the Utah Power & Light Co. will feature a special automatic electric iron throughout the month. In announcing the campaign, the dealer coordination department of the utility pointed out that the territory in 1935 should have sold 24,000 electric irons on the basis of national sales. Actual reports from dealer sales for the period showed 12,000 units sold or only 50 per cent of the potential. The campaign this year is designed to increase that percentage of sales to the potential for all dealers in electric irons.

Backing up the campaign will be advertising in 55 local papers as well as the larger dailies in Salt Lake, Ogden and Provo, Utah. Wholesale representatives from Z.C.M.I., United Electric, Strevel-Patterson, G. E. Supply, Westinghouse Supply, Graybar, Western Supply and Salt Lake Hardware contacted all dealers selling irons with an offer to trade in old irons or sad irons.

DEALER SALES REPORTS—MARCH 1936

A Summary of Dealer Reports Compiled by Associations, Societies, or Bureaus, or Dealer Contact Departments of Utilities

APPLIANCE	P. G. & E. Co.[1]		San Diego Cons. G. & E. Co.[2]		San Joaquin Lt. & P. Corp.[3]		So. Calif. Edison Co., Ltd.[4]		Utah Power & Lt. Co.[5]		Wash. Water Power Co.[6]		Idaho Power Co.[7]	
	*Mar. 1936	Year to date	Mar. 1936	Year to date	Mar. 1936	Year to date	Mar. 1936	Year to date	Mar. 1936	Year to date	Mar. 1936	‡Year to date	Mar. 1936	Year to date
Ranges	352	846	50	127	150	410	747	1,709	392	636	.....	322	887	1,509
Water Heaters	269	610	70	177	66	212	325	823	76	114	.....	193	65	134
Air Heaters—aux.	470	3,644	150	435	23	93	109	621	41	498	.....	457	12	156
Air Heaters, 220	77	248	.....	.....	49	210	.....	.....	.....	.....	.....	.....	.....	.....
Refrigerators	3,118	7,065	735	1,334	1,328	1,857	5,916	9,674	665	1,222	.....	513	564	949
Dishwashers	11	91	.....	.....	2	2	.....	.....	4	27	.....	1	3	10
Washers	2,977	8,618	280	733	576	1,284	3,369	8,657	1,043	2,678	.....	763	491	1,618
Ironers	855	2,679	90	195	132	279	713	1,783	49	157	.....	130	38	237
Vac. Cleaners	2,175	6,356	150	385	115	260	1,072	2,992	575	1,543	.....	540	112	380
Radios	7,292	27,214	1,025	2,656	689	1,937	4,751	14,309	1,074	3,926	.....	2,205	614	2,258
Mixers	593	4,938	145	286	81	230	361	1,181	281	689	.....	313	58	250
Cookers, Casseroles	.....	.....	30	91	11	42	89	186	21	84	.....	356	5	19
Irons	.....	.....	300	882	365	974	1,364	4,170	1,000	2,667	.....	1,121	336	1,027
Waffle Irons	.....	.....	175	471	104	346	395	1,379	260	1,151	.....	454	118	446
Toasters	.....	.....	255	411	145	457	542	1,756	519	1,467	.....	1,126	117	708
Table Stoves, etc	.....	.....	50	96	112	403	271	790	956	2,186	.....	106	81	227
Heating Pads	.....	.....	150	463	42	140	210	840	176	671	.....	333	31	179
Curling Irons	.....	.....	.....	.....	.....	.....	52	175	178	602	.....	.....	.....	.....
Coffee Makers	.....	.....	250	482	101	315	339	1,030	322	967	.....	778	132	397
Sewing Machines	1,289	3,981	40	71	.....	.....	.....	.....	67	241	.....	125	.....	.....
Clocks	.....	.....	.....	.....	110	315	470	1,398	228	784	.....	476	24	157
Fans	.....	.....	.....	.....	19	27	25	58	32	59	.....	28	.....	27
Floor Polishers	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sun Lamps	.....	.....	.....	.....	.....	.....	60	132	8	41	.....	29	11	33
Reflector Lamps	.....	.....	.....	.....	113	296	.....	.....	1,004	4,062	.....	.....	.....	.....
Misc. Lamps	.....	.....	.....	.....	.....	.....	.....	.....	2,867	6,494	.....	1,524	.....	.....
Yard Lights	.....	.....	.....	.....	35	115	.....	.....	.....	.....	.....	.....	.....	.....
Misc. Small Appl.	.....	.....	250	576	332	899	831	2,055	.....	.....	.....	.....	.....	.....
Total Dealers	1,400	.....	.....	.....	.....	.....	581	581	.....	.....	.....	.....	.....	.....
No. Reporting	.....	.....	.....	75	160	136†	564	534†	.....	159	.....	.....	.....	.....

[1] P. G. and E. reports obtained only on major appliances upon which accurate reports are available from dealers' accounts. Ranges, water heaters, and air heaters include company and dealer sales. Total dealers include gas as well as electric dealers. * Previous month's figures shown under current month's heading.

[2] Gathered by Bureau of Radio and Electric Appliances of San Diego County. Estimated monthly sales figures used in this table. Clocks, fans included under miscellaneous.

[3] Includes dealer reports from Midland Counties Public Service Corp. territory also. Compiled by Valley Electrical Supply Co.

[4] Includes reports from dealers on San Joaquin Valley system of the company as well as Southern California areas served.

[5] Includes Utah Power & Light Co. territory in Utah, Idaho and Wyoming. Also Western Colorado Power Co. territory.

[6] Dealer sales only for Spokane and company's territory. Company sales not included. Table stoves, grills included with cookers.

[7] Figures compiled by Electrical Equipment Sales Association. Include power company sales and sales of all reporting dealers—about 60% report.

† Arithmetical average of number of dealers reporting. ‡Latest figures available up to time of going to press.

About Imported Scotch

THE MANAGER looked up from his desk. "Well, well, see who is here. How are you Bill? So the late frosts didn't get you after all."

"How I felt is purely a personal matter and none of your business," crabbed Bill Jones; and then, seemingly grudgingly: "It was foolish of course, but I guess that I appreciate the flowers and other things you sent me."

"Humph," exclaimed the Manager, "You flatter yourself if you think I sent flowers to you. I just felt sorry for those two fine good looking nurses whom unkind fate delegated to take care of an old pesky walrus like you. It seemed to me that if they were forced to look at your ugly mug twelve hours a day, it would merely be an act of charity to place something within the range of their vision which was beautiful, or at least not so disheartening. Any time I send flowers for your own sake it—"

"As far as I am concerned you can go to hell," said Bill. "I came in merely to find out what stupendous effort you are contemplating to make my twenty shares in your company worth less."

"I am glad to see that you have recovered and are again your old genial self. Well, I don't think your absence wrecked the company. These papers on my desk, perusual of which your entrance interrupted, are reports of plans for residential load building showing how it is being done elsewhere. I am thinking about utilizing some of the best of them in our forthcoming campaign. Here is one which is especially interesting. It is how it is being done in Scotland and—"

"I might have known it," grumbled Bill. "Once dumb always dumb. What good does it do you and us stockholders to know what is being done in Scotland? Here in Silverton we haven't any Scotch population have we? What do we care what seems to be successful with an Alabama Company catering to a negro citizenry ranging from forty to sixty per cent? We haven't any negroes in Silverton. Or, what works in Fall River? Silverton doesn't close up its business district to celebrate Portuguese holidays does it? If you haven't any conch population in Silverton, what do you care what works or doesn't work in Key West? What use studying methods in Houghton, Michigan, where a collector or a salesman to be conspicuously successful must be familiar with at least five of the seventeen languages in general use up there? With so many original ways of being fane still unused, why don't you try a new one?"

"You surprise me," observed the Manager, mildly sarcastic. "I somewhere gained the impression that human nature is the one constant thing in the universe. That it has never changed and never will. That as it was in the Garden of Eden, so it is in the night club."

"Oh, sure," said Bill. "Human nature never changes and that adage being something the men in your industry can parrot off without undue mental effort, you stop right there and consider the subject to have been exhausted. But while it is true that human nature doesn't change, it is likewise true—and more important—that habits and customs are distinctive and local, and follow no universal pattern. Individually and collectively we are creatures of environment, of climate, of culture, of association, political slants, purchasing power, religion and multitude of other things which set each community, or each section of the country, more or less apart from all others.

"The various communities are as different one from another as are the hypocritical protestations of the vote getters' idealism from the acts of Jim Farley. You say in effect: if rental of ranges and refrigerators will work miracles in the territory of Georgia under a new and 'delayed-forward-pass' type of rate dubbed 'immediate' and 'ultimate' why it must work in Silverton.

"One company — accidentally or otherwise—snitches, or applies, a plan which works in its territory because it chances to fit into the idiosyncrasies of the people to whom it is applied. Immediately you all rush in to copy it without pausing for intelligent analysis as to why it works. And so we have today a great industry, which should know better, falling over itself to get out appliances on 80 cents down and 80 cents a month and all pepped up with the enthusiasm of having invented the alleged idea, and without regard of where it will eventually land. Apparently it is not aware of the fact that the gas people did all of this and more —and abandoned it—thirty-five years ago.

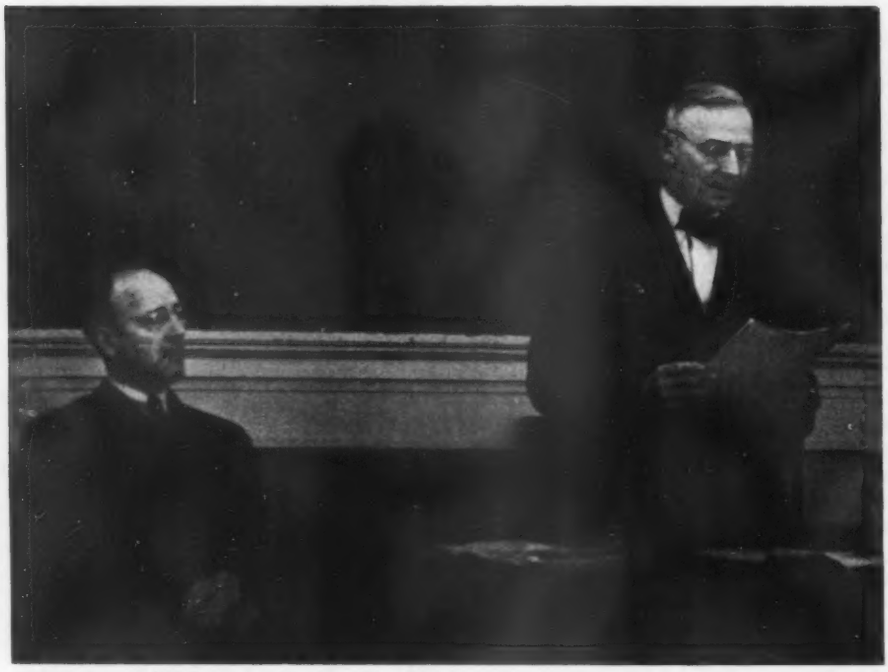
"If it is now so desirable to do these things to increase domestic load-building, it was equally desirable to have done them fifteen years ago. If you have just discovered the possibilities of the electric range and the refrigerator, how are you going to explain to us stockholders your failure to have discerned them fifteen years ago. Even then both were available in approximately their present form. It rather looks as though you will have to admit general and sustained incompetence. In other words, for many years at least you haven't known your own business. Is there any reason to assume that you have suddenly become intelligent now?

"The government and the electric power people should be better friends, for their minds certainly run in the same groove. You perhaps will remember that early in the days of the 'abundant life' there was established in Silverton a new bureau to take care of the young children of working girls. Eight teachers were employed. Eventually after much solicitation and publicity, the new scheme was reluctantly abandoned, but not until it was found that the greatest number of children available was seven—for eight kindergarten teachers. Now of course, probably the reason for this sort of thing is that some bright social worker attached to an administration which is not so bright (but is political) having heard or read something of conditions in the slums of New York or the Ghetto of Chicago, assumed as a matter of course that the same would apply to Timbucktoo, Seattle, or to Silverton. The government is continu..lly doing this sort of thing—probably 'we planned it so'—but there isn't any special reason I know of why you shouldn't use your head and acquire some knowledge of the things which motivate the particular people with whom you live. Don't try to amend economic law with an incantation nor try to use the same promotional methods on a community built north of the tracks that you do on one in the hills, nor in the horticultural regions that you do in the industrial centers, even if human nature is the same. The cash register will be more active if you try to adapt your methods especially to them and to their notions than it will, if you try, no matter how, to make them conform to what you think they should do or what the factory workers of Lawrence do. Selah.' "

Bill went out and the Manager turned back to his desk, picked up his pencil and resumed his adaptation of the methods of the XYZ Electric Co. and its electric range rental plan.

With the Trade Associations + + +

[An Exchange of Plans and Ideas for Assisting the Industry in All Branches to Solve Some of Its Problems of Trade Relations and Business Ethics]



Fresno. Seated, W. C. McWhinney, Southern California Edison Co., led Business Development sessions; standing, K. B. Ayres, San Diego Cons. Gas & Elect. Co., presiding at Operating Economics section meeting

P. C. E. A. Makes Essay Awards at Fresno Meeting

New vitality and aggressive confidence characterized the annual spring conclave of the Pacific Coast Electrical Assn. held April 9 and 10 at Fresno, Calif. Over 250 men and women representing an unusually wide cross-section of the electrical industry as a whole attended the two-day meetings to hear the prize winning papers of the 744 contestants. The enthusiasm and optimism which was evident on every hand more than justified the recent decision of the Association to expand its activities during the coming year (see *Electrical West*, April, 1936, p. 52 for organizational changes).

Delegates were officially welcomed by A. Emory Wishon, president of the San Joaquin Light & Power Corp., in whose buildings the meetings were held, and by F. O. Dolson, president of the Southern Sierras Power Co. and retiring president of P.C.E.A., who officially opened the meeting.

The first order of business was the reading of the prize-winning papers on the eight problems placed before the membership of the Association last December. Prize-winning papers will be published in full in the June issue of ELECTRICAL WEST. The complete list of prize winners is given below.

The remaining sessions of the conclave were devoted to presentations by each branch of the industry tending to promote mutual understanding and better coordination of activities to the end of greater electrical development. Ralph Wiley, chief of the Department of Electricity, city of San Francisco, spoke for the electrical inspectors on the need and mechanics of a plan to eliminate substandard appliances and equipment and the attendant hazards thereof. J. O. Case, Quality Electric Works, Los Angeles, presented the electrical contractors' problem in which he asked for intelligent consideration, sympathy and cooperation of the remainder of the industry in breaking the "bottleneck of the electrical industry," as adequate wiring has been designated. The presentation, ably presented as it was, gave a new picture of the electrical contractors' problems and their relation to the industry as a whole.

Similarly, the electrical wholesalers, by means of a radio dialogue, presented the wholesalers' problems and the very definite benefits which electrical wholesalers render the industry as a whole. In another radio skit patterned after the March of Time the attention of the meeting was very definitely focused upon the need for aggressive selling in the domestic market which is growing increasingly competitive.

In a well received skit written by Dick Smith, executive assistant of the Southern California Edison Co., and entitled "The Lighting Market—Where Is It?" the great potential field load building via industrial, domestic, commercial, and highway lighting was portrayed. The play was staged by George Rankin, lighting specialist for the Southern California Edison Co., who directed an excellent cast of actors recruited from that organization.

E. E. Valk, engineer of the General Electric Co., Los Angeles, presented a paper on the new transformer and circuit breaker developments, emphasizing the ability of the manufacturers to meet the requirements of high voltages and high interrupting capacities necessitated by increasing concentrations of power. Another paper presented by Rollo J. Cobban, Westinghouse Electric & Manufacturing Co., San Francisco, described voltage regulation by means of tap-changing equipment and its application to current transmission and distribution problems. An interesting demonstration equipment was used to illustrate the talk. Also of interest was an illustrated talk on the construction of the San Francisco-Oakland Bay Bridge presented by Allen G. Jones, of the General Electric Co., San Francisco. A group of slides made from progress pictures taken by the bridge contractors and personally selected by Mr. Jones added to an already interesting presentation.

Luncheon meetings were held during both days of the sessions and an official banquet concluded the sessions. At the Thursday luncheon, H. J. Bauer, president of the Southern California Edison Co., addressed the gathering on the subject of "The Responsibility of the Individual to His Job" in which he emphasized the great need for courteous contact and a cheerful attitude on the part of every employee, not only during working hours, but 24 hours out of

every day, the time that electrical service is available to the customers.

A. E. Wishon, president of the San Joaquin Light & Power Corp., also spoke on the need for association activities and the values to be derived therefrom. He urged greater interest and attention be given the work of the Association by everyone in the industry as a means of promoting progress and prosperity of the community, the company, and the individual.

At the Friday luncheon, R. Bourke Corcoran, of the National Electrical Manufacturers Assn. of New York City, was introduced by R. M. Alvord, vice-president of the P.C.E.A. Mr. Corcoran spoke on the activities of Nema, its objectives and its place in promoting the development of all phases of the electrical industry.

At the final banquet, Gaylord G. Buck, general commercial manager of the Public Service Co. of Colorado in Denver, gave an inspirational address in which he set forth the responsibilities of the electrical industry toward society and urged that every individual accept these responsibilities with courage and confidence and a determination to see that the progress made during the past 50 years does not slacken pace.

Preceding Mr. Buck's address the P.C.E.A. cash prizes won in this year's P.C.E.A. problem contest and consisting of a first prize of $50, a second prize of $25 and a third prize of $10 for each of the eight problems were awarded to the following winners:

Problem No. 1—"How Shall We Bring Wiring Both in Old and in New Homes up to Reasonable Adequacy for the Convenient Use of Electricity?"

First prize, T. Ralph King, sales department, G.E. Supply Corp., San Francisco.

Second prize, C. L. Ashley, commercial department, Southern California Edison Co. Ltd., Los Angeles.

Third prize, R. C. Cook, Pacific Gas and Electric Co., Willows.

Problem No. 2—"How Shall We Increase the Domestic Use of Electricity?"

First prize, F. D. Aiassa, Pacific Gas Counties Gas & Electric Co., San Jose.

Second prize, George Byrne, Coast Counties Gas & Electric Co., Watsonville.

Third prize, A. Balchin, Pacific Gas and Electric Co., Monterey.

Problem No. 3—"How Can We Increase the Commercial, Industrial and Agricultural Uses of Electricity?"

First prize, W. R. Bowler, division sales manager, Pacific Gas and Electric Co., Chico.

Second prize, Gilbert C. Delvaille, rate engineer, Southern Sierras Power Co., Riverside.

Third prize, R. A. Crosby, lighting specialist, Los Angeles Gas and Electric Co., Los Angeles.

Problem No. 4—"How Shall We Develop Better Coordination in the Industry?"

First prize, J. O. Case, contractor, Quality Electric Co., Los Angeles.

Second prize, Harold G. Tubbs, sales department, General Electric Co., Los Angeles.

Third prize, K. M. Noble, contractor, Pacific Electric Motor Co., Oakland.

Problem No. 5—"How Shall We Find a Steady Load for Existing Facilities?"

First prize, W. A. Andree, engineering department, Southern California Edison Co., Los Angeles.

Second prize, G. M. Babcock, engineering department, Los Angeles Gas and Electric Co., Los Angeles.

Third prize, Dean D. Cutting, engineering department, Southern California Edison Co., Los Angeles.

Problem No. 6—"What Constitutes a Reasonable Continuity of Service on Feeders?"

First prize, H. A. Lott, load dispatcher, Southern California Edison Co.

Second prize, F. D. Beardsley, Coast Counties Gas & Electric Co., Santa Cruz.

Third prize, A. Frank Ayres, engineering department, Southern Sierras Power Co., Riverside.

Honorable mention, Lloyd Hunt, engineering department, Southern California Edison Co., Los Angeles.

Problem No. 7—"How can the Cost of Electric Distribution be Lowered Giving Due Consideration to Adequate Service and Regulation?"

First prize, R. J. Cobban, Westinghouse Electric & Manufacturing Co., San Francisco.

Second prize, H. H. Minor, San Joaquin Light & Power Corp., Fresno.

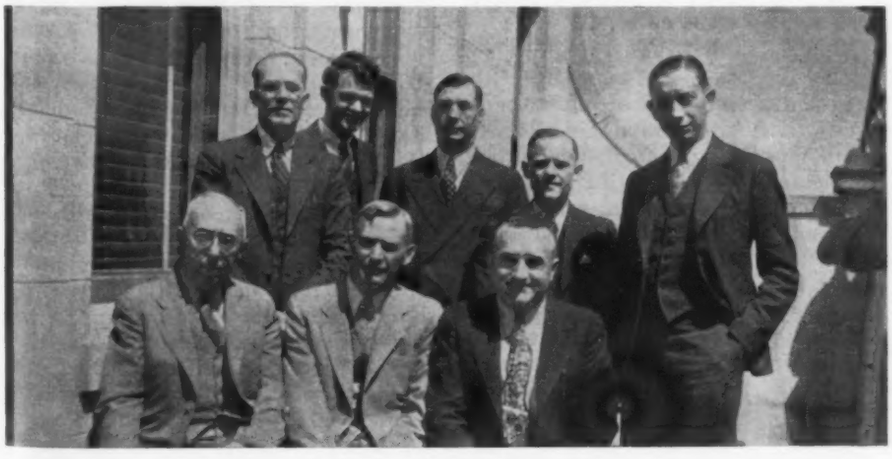
Third prize, Harvey L. Smith, Pacific Gas and Electric Co., East Nicolaus.

Problem No. 8—"How Can the Cost of Service Entrance Wiring Methods be Modified for the Purpose of Simplification and Cost Reduction?"

First prize, R. C. Stackhouse, Westinghouse Electric Co., Los Angeles.

Second prize, O. E. Keeler, Westinghouse Electric & Manufacturing Co., Woodland.

Third prize, A. L. Gaenicke, Pacific Gas and Electric Co., Woodland.



The Winners—standing (left to right) H. A. Lott and W. A. Andree, both of the Southern California Edison Co., Ltd.; R. J. Cobban, Westinghouse El. Mfg. Co.; T. B. King, G. E. Supply Corp; and W. R. Bowler, Pacific Gas & Electric Co.; seated (left to right); J. O. Case, Quality Electric Works; R. C. Stackhouse, Westinghouse El. & Mfg. Co.; and F. D. Aiassa, Pac. Gas & Electric Co.

N.E.C.A. President Tours West on Speaking Trip

Earl N. Peak, president of the National Electrical Contractors Assn., is making an extensive trip throughout the West as this issue goes to press. Carrying a message of industry cooperation and mutual helpfulness, Mr. Peak has spoken not only to contractor groups but to large industry gatherings in all the principal cities of the West. He started on his Western tour from his home in Marshalltown, Iowa, April 4 and will not return until May 23. During this tour he covers cities in Missouri, Oklahoma, Texas, Arizona, California, Oregon, Washington, British Columbia, Idaho, Montana, Utah, Colorado, Nebraska and back to Iowa.

Under his administration was formed the National Committee on Electric Industry Promotion, of which he has been made the permanent chairman. Reports in detail of his talks will be given in the next issue of ELECTRICAL WEST.

Those Who Have Forgotten the Language

IN THE March ELECTRICAL WEST I read a goodwill building suggestion by Jay Bee. Excerpt: "To be sure, there are (high grade public contact men) in the industry, but they have a vast array of other 'must' duties. Public relations are sidetracked or delegated to other employees whose qualifications, and therefore abilities, prevent the company from getting full value from the contacts . . . with management crying for more and more contacts, isn't it possible that too much stress is being laid on the number of contacts and not enough on the quality . . . ?"

In the same issue, an editorial quoted a sales official:

"There are 5,000 men and women in our territory selling electrical appliances. Most of them are woefully ignorant of the rudiments of salesmanship and few if any know the rates, policies or service facilities of (their) companies."

Those two, Jay Bee and the sales official, should get together. In my opinion, one sees the problem but not the answer, and the other has the answer, but overlooks the problem.

Certainly management is crying for more contacts, meanwhile ignoring the results. In sales work, thanks to the law of averages, there is a balance between results and the number of calls; and in its new-found sales-mindedness, management is attempting to apply the same formula to contact work. The two cannot be reconciled since there is no law that applies to, or formula that can be developed for, human contact.

The public mind responds quickly to emotional appeals, by which goods are sold. But it responds with ungraceful slowness to logic, by which the utilities are trying to sell themselves through personal contact. Therein lie the ill and the cure.

In selling, say floor lamps, the results of the salesman's work are always ascertainable. If he comes in with the orders, his day has been well spent. To a large extent, it doesn't matter whether he got his orders in six calls or twenty. But in selling human relations, the results are not so easy to judge, day by day. The results are votes which are not to be counted until two, six, twelve or perhaps twenty-four months hence. So management judges the success of its efforts by the number of calls per man, and the man, poor soul, feeling that he must make lots of calls to show his boss he's been working, often is afraid to really search out grievances because they take time to adjust, and keep him from making lots of calls.

Moreover, he perhaps mistakenly feels that he shouldn't spend time on call-backs. The lamp salesman sometimes makes a dozen calls before he gets the order. Is it reasonable to assume that a customer's adverse opinion —stubbornly resisting change—can be altered on the first or second call?

Before contact work can be truly productive, management must sit down and decide what one major result is being sought. If it is votes, then the number of contacts must be forgotten for the moment. Next, the employees doing the work must be made to understand that they are to use their time in the manner that seems wisest and most productive to them (within certain bounds, of course). If a man makes only four calls in the day and honestly feels he has acted in the company's best interest, he will not be graded lower than the man who makes fourteen calls.

If the management cannot trust the employees this far, it is either a sad commentary upon employee loyalty (management's fault, if the employees have been there long enough to be chosen for this work), or an egregious error of judgment in selecting men for such an important mission.

Who should be selected? Surely not, as Jay Bee suggests, those men who have had a vast array of other "must" duties. They are unsuitable not because their "must" duties are too important, but because those duties have been too confining. They have lost contact with the man in the street; they have forgotten the language, much as they would forget English if they were living in a foreign country among those who spoke only the foreign tongue. Further, they know too much of the detail and are confounding the knowledge. Oh, there are a million reasons why they won't do. (I must, of necessity, speak in the broad sense. Some few would do very well).

Would those 5,000 men and women mentioned in the editorial do? Being salesmen, in daily contact with the public, they must speak the right language and think in favorable channels. Yet they, or most of them, by their very ignorance of the rates, policies, etc., are one of the chief causes of the trouble. In medical parlance, they are "carriers" of the disease of discontent, because discontent is bred by ignorance. If, in talking to a recalcitrant, they use the familiar, "don't blame me, I only work for them," or, a bit more honorably, confess inability to defend a policy because they don't understand it themselves, the recalcitrant assumes the policy indefensible and becomes more firmly convinced of the injustice of it all.

Change all this if you will; school them thoroughly, teach them well; get them all to pass examinations with perfect marks. In the end you still have a group of product salesmen; you haven't changed their temperament. By their ability to answer questions, they may refrain from doing further harm, but that they will do anything positive, anything toward winning public favor, is doubtful. They haven't been educated for the task at hand.

Now management is in favor of education. Some utilities support educational systems so that the employees will become better workers, better able to do the present job and better qualified to fill a bigger one. Are these employees given instruction only on rates and policies and utility matters? Certainly not.

Management contributes to courses for salesmen, because the better trained salesman uses his tools more wisely and well. What are the courses all about? Rates and policies and utility matters? Don't be absurd; they teach the salesman how to sell.

Yet what inspired management has ever given the proper training to those employees selected for that vital work of contacting the public? And by proper training I mean training in the art and science of personal salesmanship—selling one's-self.

The trouble with the aforementioned 5,000 salesmen who know nothing about the utility is that, in the last few years, thanks to the artificial stimuli, product salesmanship hasn't required a knowledge or application of personal salesmanship. Surely, Joe Blank is a top salesman and he has a fine personality.

a winning smile, and easy approach. But Joe may not know beans about adaptability, which is the first essential in human contacts. And Joe may lose that winning smile and easy manner when he has nothing solid and tangible, such as a refrigerator, to literally and figuratively hang onto while he is under fire. Joe's past training has been in selling something that someone wants, but none wants someone else's opinion for his own.

Products may be sold, but logic or opinion never. Logic is merely accepted. I accept the logic of your arguments and fall in with your opinions because first you have sold yourself to me as an honest, earnest fellow who knows what he is talking about. Whether you sold yourself consciously or unconsciously doesn't matter; the point is, you did it.

This contact job requires a knowledge of human relations, an understanding of the reasons for human actions and reactions, With this background, the student can adjust himself to each individual whom he contacts, and can proceed to sell himself so he can sell his company.

I've often wondered why some enlightened utility executive hasn't hired a practicing student of human relations (call him a psychologist if you will) to teach these fundamentals to his contact men. The first one who does will be in line for a medal for leading the way out.

•

Optometrists Now Prescribe Lighting

Use of light prescription lamps by optometrists is advancing. Gordon F. Black, illuminating engineer, Southern Sierras Power Co., Riverside, reports an installation by Dr. Lowell V. Duncanson, optometrist of San Bernardino of one of the new light testing equipment using a sight meter and a special louver lamp. When patients are fitted for glasses at the same time a test is made of the amount of light which provides them comfortable seeing with such glasses. The optometrist then prescribes that reading and close work shall be done in the home under that amount of illumination. Thus satisfaction with eye glasses is assured with proper lighting conditions surrounding their use.

Optometrists in various parts of the West are testing such equipment with a view to eliminating a number of those complaints which come from difficulties their patients experience with new glasses until they become adjusted to their use. Much of the trouble has been found to lie in the fact that their eyes are tested under fine lighting conditions in the optometrist's laboratory but that the use of the glasses at home under poor conditions brings dissatisfaction and discomfort. Hence it is important that advice be given patients on the correct amount of light necessary to attain the best results from the use of their new spectacles.

•

Letters...

An Autobiography for Self-Sympathizers

To the Editor:

Answering the "dollar bill" letter appearing on page 24 of the March isue of Electrical West.

I, too, worked in a Skim Milk town for my company. I, too, worked before breakfast and after dinner and was on call at all times. But we lived in the rear of the office, and my wife answered the telephone and sold lamp globes and collected bills when I was away, besides doing her house work and caring for two small children. I've gotten up from my meals many a time to sell a lamp or take the money for a light bill. We never locked the office door until we went to bed. Hell, this guy never done nothin' compared to what many a small town manager used to do. But with improved conditions our company has no more combination office and residences. I kept the ledger for 175 accounts, made out the bills, and collected. I wired a house now and then, extended the secondaries if necessary, hung a transformer, ran the service and did the whole thing with occasionaly a helper. I bought my own typewriter for $10, and a used adding machine for $60. The railroads and other corporations did not furnish them, neither our company, then. I found time to sell a few hundred dollars worth of merchandise. And in those days we got no commission either.

I never got $135 a month, let alone $150. I got $75 a month, a house and light, and I did not get over-time. Gosh, I worked ten to sixteen hours per day, but I was happy; I was interested and enthused with my work. My wife used to complain about my working so much, and of the little time I spent at home. But she was a good manager, and she did more than her part in taking care of the home. Without her I could not have done so well, for I never had to worry or use any time planning for the home.

Butter was 50c and eggs were 60c, in the winter, and generally living costs were more than now, certainly not any cheaper, for this was less than twenty years ago. If we went to a party or I went out to play ball on Sunday, the telephone girl was sure to find me if anything went wrong. But I liked it; I did not feel that I was abused. I rested; I took time off now and then; and anytime I wanted a day of two off I never had the least objection offered. Of course, I worked for a wonderful boss and a wonderful company.

I am pleased this fellow qualified his article with the loyalty with which he finishes it as it softens an otherwise exaggerated recital. For there is many a family living on $100 and much less per month, paying their bills and getting by. I am not arguing for low wages. I hope that he gets the $15 and will eventually have much more.

This has been written so that those who have read the article and happen to see this will not feel abused and give themselves too much self-sympathy. They can better their condition, raise their own living standard and eventually have much more of life's pleasure and compensations if they are willing to pay the price. The price means service, courtesy, friendliness, the golden rule and study; and you won't need to shock anybody by asking for a raise; they'll shock you by giving it to you when you least expect it.

And in closing I can't think of anything that seems more fitting than this gem by Elbert Hubbard:

"I believe in the stuff I am handing out, in the firm I am working for, and in my ability to get results. I believe that honest stuff can be passed out to honest men by honest methods. I believe in working, not weeping, in boosting not knocking, and in the pleasure of my job. I believe that a man gets what he goes after, that one deed done today is worth two deeds tomorrow, and that no man is down and out until he has lost faith in himself. I believe in today and the work I am doing; in tomorrow and the work I hope to do, and in the sure reward which the future holds.

"I believe in courtesy, in kindness, in generosity, in good-cheer, in friendship and in honest competition. I believe there is something doing, somewhere for every man ready to do it. I believe I'm ready—Right Now!"

J. D. Lewis,
Palouse Division Manager
The Washington Water Power Co.
Pullman, Wash.

Praise for Sales Guide Demerit for the Industry

To the Editor:

It is not often that I take my typewriter in hand and comment on articles appearing in publications, but (and this is a very large BUT!) in going over your editorial in the March issue on the subject of Lost Ground on Wiring, it occurred to me that your attention should be directed to the fact that we have made an active drive for Red Seal Homes during the year 1935, with the result that 376 certificates were issued.

This accomplishment was so gratifying that we now have nine men in this department working under Mr. H. H. Douglas, contacting all new builders, telling the story of Red Seal air heating and air conditioning. We are [illegible]ing over 1 200 Red Seal jobs this year.

Better than 70 per cent of the certificate owners have installed electric ranges, which shows the effectiveness of the work. We also signed up 6,500 h.p. in space heating during 1935. The branch of the industry most vitally interested, the electrical contractor, is rendering every assistance to make this Red Seal Plan effective. I cannot say so much for the people of the industry, however.

In fact, it is harder to sell the all-electrical idea to a member of the industry who is building a new house, than it is to sell to a layman, and the higher is the position of the builder in the scale of importance in the electrical industry, the more difficult is the task. That is one problem I wish your magazine could solve! Next time one of your field men is in this territory, it might pay him to investigate this Red Seal activity. So much for that.

I want to compliment you on the Appliance Sales Guide on electric ranges which appeared in your March issue. It is very comprehensive and should prove a real assistance to dealers in training their salesmen.

With best regards, I am

Very truly yours,
H. C. Rice,
Merchandise Manager
Southern California Edison Co., Ltd.
Los Angeles, Calif.

EDITORIAL + + +

P.C.E.A. Progresses

TWO years of experience of the revivified Pacific Coast Electrical Association as typified by the recent highly successful Fresno conclave have proved the need for and the profit to be derived from an all-industry organization. Just as a child must creep before it walks, so must a body of this character feel its way along until it is certain of its purposes, sure of its field. Only then may it set its course to take full advantage of the opportunities for tangible accomplishment developed from this initial period of growing pains and halting steps. Here are some of the things revealed by the Fresno meetings:

By its accomplishments and the opportunities it has uncovered the association has won the full support of the executives of the industry. This one fact augurs well for future success. Weaknesses revealed by past experience have been corrected through the adoption of an expanded program which recognizes groups and problems hitherto overlooked. Among these are the real benefits to be derived from personal discussions of mutual experiences and problems by those in the industry charged with common responsibilities. The human values of the personal contacts which only come through conclaves and meetings have been given recognition.

Equally as important as the splendid and fruitful suggestions developed through the problem paper contests is the one glaring weakness which these contests have disclosed. This is the appalling lack of knowledge of some of the fundamental phases of the industry. This ignorance runs the gamut from engineering technology to simple aspects of company policy. It emphasizes the need for an educational program which will acquaint the rank and file with vital facts about the industry that gives them their livelihood.

Prime achievement of the contests has been to focus attention on the problem of industry coordination. Outgrowth of the discussions and papers on this subject has been the formation of an industry coordination committee representing all five branches which will act in a judicial capacity in the settlement of disputes and the solving of problems involving two or more branches of the industry.

Proof that the Association is achieving its purpose of serving the whole industry was contained in the results of this year's contest. Winning solutions to the eight problems came from contractors, wholesalers and manufacturers as well as from the utilities. Here is real progress in the development of mutual understanding of the common interests and common responsibilities of every group in the industry.

Although the conclave program was comprehensive and educational, there were one or two phases which aroused criticism. Seemingly the industry has lost, through disuse, some of the technique which made programs in past years vital, animated and interest-compelling. This showmanship can and will be revived. Apparent was the glaring need for universal training in public speaking. Perhaps a revival of the public speaking contests of years gone by will correct this fault.

Finally, the conclave revealed this fact: With the field for profitable accomplishment expanded, with its aims and purposes more clearly defined and with definite assurance of executive interest and support, the P.C.E.A. is headed forward toward the goal of industry solidarity and understanding and of mutual and individual betterment for all its members.

"We Use It Ourselves"

FIGURATIVELY the bald-headed barber may grow hair and the shoemaker's children wear shoes. The electrical industry is going to do something about the old adage, "Do as I say but not as I do." For a starting point, an "Electrify the Industry" program sponsored by the Electrical Development League of Southern California has selected electric cookery. When the campaign is completed if most electrical wives in its territory do not use electric ranges, then they will at least be familiar with their advantages. There will be no more such comments from electrical people as "electric ranges are expensive" or "electric cookery is slow."

Sporadic efforts in the past have sold ranges to utility employees and some companies have commendable range saturations among their rank and file. In this case, however, the drive is directed at every branch of the industry. Employees of the wholesalers will be the first to get the complete story. The best sales talent in the industry reinforced by capable home economists and convincing demonstrations will furnish the proof that electric cookery is to be desired because of its many advantages as well as from a self-interest standpoint.

So that the campaign may have the force of industry opinion behind it, small emblems are being prepared with one, two or three stars on them, each star to designate ownership of one of the three major appliances—range, refrigerator or water heater. Will appliance sales to members of the industry be increased if this plan works out as anticipated? Just let your imagination picture the embarrassment of some people you know in the industry when they are asked where their "Three Star" button is!

Power Economics

ULTIMATE significance of the Boulder Dam project to the economic geography of California has been brought into clearer focus by the signing of a contract for power interchange between the Southern California Edison Co. and the Pacific Gas-San Joaquin Power systems. Here is proof of the desirability of system interconnection and of the adaptability of the high tension network that extends from one end of the state to the other. Expressed in simplest terms here are the facts:

With the advent of Boulder power, Los Angeles Bureau of Power and Light will no longer require purchased energy from the Edison company. Edison thus will have an immediate surplus, to be augmented later by its allotment from Boulder Dam. However, on account of load growth, San Joaquin requires immediate additional capacity. Normally this would come from a steam plant in the valley or by transfer from P. G. & E., which in turn would add to its steam capacity. Weighing all of these factors one reaches the logical conclusion which dictated the new Edison-P. G. & E. contract.

All parties, including the ultimate consumer, benefit from the savings made possible by the interchange. Edison retains load and revenue. P. G. & E. saves on fixed charges for added capacity. Use of Big Creek power in the San Joaquin Valley immediately adjacent to the plants reduces transmission line losses. Load factor is improved, and natural resources are used to the fullest advantage. All of these mean savings to the consumer, who after all is the one whose interests must be served.

Not So Sweet

EVER since the Blue Eagle folded its wings there has remained a vague doubt in the minds of trade association members as to just what they *could* do in the way of association procedure that would be legal. Unfortunately the Sherman and Clayton acts to prohibit "trusts" or monopolies have always been negative in their attitude. One tried something, and it was tested in courts to find out whether it would stand. If it received a clean bill of health, it was allowable. But if the courts disapproved, they said in effect, "you cannot do that", but failed to declare just what could be done instead.

It is no wonder that universal attention of trade associations was focused on the recent Sugar Institute case. Brought into court for restraint of trade the Institute was shown to have an open price filing system, to which members pledged adherence to their own published prices and terms. The court held this agreement to uphold one's own published price illegal, although it admitted the need for and the desirability of open price declarations. The sin seems to be in agreeing to hold to one's own price, declared in advance, if that means that the freedom of buyer and seller jointly to determine price or other conditions of sale in specific transactions is limited. In other words, the seller must be always at the mercy of the sharp buyer.

Speaking on this subject to a group of trade association executives in New York City, William J. Donovan, formerly of the Federal Trade Commission, made this significant statement:

"No people will ever permit industry to determine the amount of goods which are to be produced and the prices at which they are to be sold, without at the same time imposing upon industry close supervision and exact regulation." And later: "Those who advocate the repeal of the Sherman Law are inviting government intervention in business, and the more completely we replace individual freedom by group action, the more detailed will be the governmental control".

In view of the return of chiseling practices and the breakdown of such gains in business standards as were made under the N.R.A., with the inevitable demand that may follow for a return to some form of government regulation of business, this principle is one that should be weighed very carefully. The harassed business man must ask himself very bluntly which evil he would rather face—that of unethical competition within his own group, or the meddlesome restrictions and impositions of governmental regulation.

Will the cure be worth the medicine?

More Competition

"COMPETITION is one of our major problems," said the manager of a utility power sales department recently. He went on to outline how gasoline service stations, utilizing the abundant supplies of cheap fuel which they sold, were installing engine-generator sets to supplant central station service for their lighting and power loads. This was but one instance of many which he cited. On another floor of the same building the utility advertising department proudly displayed a new printing installation which would turn out display posters in large quantities at a considerably lower price than had been previously paid to a local printing house. In both instances there was an apparent question of economics involved; both the gasoline station proprietor and the advertising manager were striving to reduce costs. Will the local printer talk like the power sales manager or will economics win out over public relations? Which is more important? You guess. We already have.

Significant Trends + + +

[Signposts which point the road to improved business or method, brief, pertinent, useful hints as to HOW someone has blazed a new trail]

Model School Lighting Watched by Educators for Results

WHEN a superintendent of schools makes a lighting laboratory out of one building in order to convince himself, his teachers and his community as to the worth of lighting as a means of checking eye defects in the pupils, that is news. Therefore, the installation at Martinez grammar school No. 2, of Martinez, Calif., which the school board authorized Forrest Routt, superintendent of schools of that city, to have installed last year and which is now functioning as a laboratory of that type, has special significance in the school lighting situation in California. Indeed, it is being commended and observed by other school authorities of the state as a practical test of the efficacy of lighting.

To Reginald B. Keating, illumination engineer of the lighting bureau, East Bay Division, Pacific Gas and Electric Co., should go considerable of the credit for the installation. For over five years he brought factual information to the attention of Mr. Routt upon which he could base his requirements for the first school installation. Realizing that the lighting was very poor at this particular school, he had asked the P. G. and E. salesman to make the survey.

The survey itself showed that an average of 2 foot-candles was all the light that the classrooms were getting on cloudy days, with a maximum of 60 foot-candles near the windows and ranging down to less than 2 foot-candles on the opposite wall. On sunny days the range of lighting ran from 75 to 300 foot-candles near the windows down to from 2 to 8 foot-candles on the opposite wall, depending on the location of the room in relation to the outside exposure of the building toward the sun.

In order to assist with the program a written brief, covering the results of these findings, was prepared and presented to the school board. Recommendations were made to obtain at least 20 foot-candles and to take into account that portion of the light which would come from natural daylight through the window. It was then planned to furnish an average of 15 foot-candles of artificial light and to depend on the outside daylight to furnish the additional 5 foot-candles.

Contractors were called in for estimates and the cost of the installation was agreed to as satisfactory. The redesigning of the school lighting was then turned over to W. H. Weeks, architect, and Leland & Haley, consulting engineers.

With the same exposure the camera tells the story of improved conditions in the Martinez school under artificial light. At the left a photograph taken without the artificial light turned on, showing good illumination on the desks near the windows but such darkness along the opposite wall as to be unrecorded on the negative. The photograph at the right shows the more uniform illumination with the artificial lighting turned on. Note the photo-electric cell mounted above the blackboard on the left wall

•

The plans were drawn to use six 500-watt totally indirect units per room, equipped with inside frosted lamps. Wherever possible wiring was concealed, but where this was not practical because of the rewiring of an old building, wire-mold was used on the ceilings for the runs to the new fixtures. Hersey Electric Co. and Alhambra Electric Co., both of Martinez, joined together in handling the contract.

Each room was likewise provided with wiring for photo-electric control of the lighting and the first room of the thirteen rooms in the school, all of which are later to be so equipped, was completed with the cell installed. Provision is made to control the photo-electric cells from a central switching point.

After installation, foot-candle readings were made. It was found that an average of 17.4 foot-candles of artificial

light was provided in all the rooms, which increased the room lighting up to an average of 25 foot-candles. In the test room, without the light from the artificial sources, light on desks along the windows was of 60 foot-candle intensity while that along the wall was only 2 foot-candles, on a sunny day. With the units turned on the lighting was increased to 19 foot-candles along the opposite wall and the average for the room was 25 foot-candles.

The photo-electric cell was set at 12 foot-candles. Placed on the wall opposite the windows, when the light drops below 12 foot-candles in the room the artificial light automatically turns on. When the lighting increases to 25 foot-candles the photo-electric cell and relay shuts the artificial light off.

As a means of checking the effectiveness of this lighting, Mr. Routt has instructed the school nurse to keep a record of the condition of the eyes of the pupils both before and after the installation. He asked her also to take into account other factors which might affect their eyesight so that an unbiased record of data on the effectiveness of lighting and reduction of eye defects may be obtained for future reference. This superintendent likewise hopes that as the public accepts the idea, with the data available on hand as proof, other schools of the community can be rewired and relighted in turn; first the kindergarten and then the high school.

●

• MEETINGS WITH THE PAINT, Venetian blind and other similar interests and the Pacific Gas and Electric Co. in order to promote a better cooperation in the Better Light-Better Sight movement have been inaugurated in San Francisco by R. E. Stevens, Pacific Gas and Electric Co., San Francisco division. Walter Carlson and Leo Gianini, Incandescent Lamp Division, General Electric Co., assisted with demonstrations of reflection values and discussions of paint in relation to light delivered for the money. Other meetings along the same lines are being planned.

●

• F. B. NIGHTINGALE, creator of garden lighting equipment that blends into the garden itself, has just issued a new catalog of garden lighting equipment for his "Kim Manufacturing Co.," 423 Molino St., Los Angeles. The catalog gives illustrations of each of the various pieces of equipment, describes their use and variety of applications, and lists their selling prices. Those who install garden lighting equipment will find many novel and interesting lighting and electrical devices which either control the equipment or do the lighting in an unobtrusive fashion.

...in Wiring Rules

Wiley Succeeds Mitchell as I.A.E.I. President

Ralph W. Wiley, chief of the Department of Electricity, San Francisco, was named president of the International Assn. of Electrical Inspectors at a meeting of the executive council in Chicago late in April. He succeeds to a position made vacant when Claude W. Mitchell, Board of Fire Underwriters

RALPH W. WILEY

of the Pacific, died last winter. Appointed to Mr. Mitchell's place by the Southwestern Section, he now becomes president of the I.A.E.I. as well.

Mr. Wiley was president of the Southwestern Section during the years 1930-31 and held his convention in San Francisco. He has been chief of the Department of Electricity of San Francisco since June, 1920, when he succeeded Arthur Kempston. He entered the electrical industry in the employ of Pacific Telephone & Telegraph Co. in 1905 as a member of the installation department. In 1908 he left to become a superintendent of an independent telephone company and in 1912 joined the Department of Electricity, starting as an underground engineer in charge of installation of police and fire alarm systems. In 1915 he worked with J. N. Barry and drew up the circuits and supervised the installation of the signaling systems at the first central fire alarm station. In April, 1917, he was appointed assistant chief of the Department, continuing to perform the duties of underground engineer.

Since becoming chief he has installed the new central fire alarm system, the police radio system, invented the traffic signals and installed the system for controlling them in San Francisco. An excellent executive and administrator of his inspection staff, Mr. Wiley has been a decisive and practical minded developer of wiring rules and codes.

Salt Air Corrosion Being Studied by Inspectors

ANOTHER varied bill of fare of inspector problem discussions characterized the Southern California Chapter, International Assn. of Electrical Inspectors, meeting held at Pomona City Hall recently when Frank McMahon, Pomona city inspector, was host. Chairman Otis Newcomb, city inspector of Long Beach, presided and obtained the next meeting for May 27 in Long Beach.

V. Hannum, city electrician of Anaheim, presented an excellent paper supplemented by a chalk talk illustrating the problems worked out by himself with the architect and electrical engineer in the wiring of the Anaheim High School for complete electric heat. The building is served by four separate circuits ranging in capacity from 700 to 800 amp.

Considerable discussion continued also on the effects of salt atmosphere upon wiring materials along sea coast locations. Harry V. Dobson, Santa Barbara; H. L. Caldwell, Bureau of Power and Light, Los Angeles; Mr. Johnson, engineer, Union Oil Co.; Chairman Newcomb, Long Beach, and G. E. Price, county electrical inspector, Santa Ana, participated in the discussion. Inspectors Price and Dobson were appointed to investigate corrosion at ocean frontages with the assistance of J. G. Moyen, Diamond Electric Manufacturing Co., who will loan salt spray equipment for tests.

Congratulations were extended Frank McMahon for the exhibit of bad wiring practices and electrical failures which he had collected and prepared for display purposes. This display is described in detail elsewhere.

Manager Grimes, of the Radio Interference Engineering Bureau, speaking on radio interference, pointed out that 65 per cent of troubles are traced to the complainant's own wiring in his own home. An interesting feature brought out, however, was that electric razors cause a great deal of interference. This lead to the question as to whether Underwriters' Laboratories include radio interference in their standards, to which H. G. Ufer declared this is now under consideration.

Merrill A. Burt, president, Electric Sign Flasher Co., presented another interesting paper on sign flashers and the characteristics of neon flashers. R. H. Manahan discussed the proposed new arrangement of the National Electrical Code and invited comments from Chapter members. He asked in particular for consideration of definitions of branch circuits, service drop regulations and similar items.

Inspectors Head East to Revise N. E. Code

Six Westerners trouped Eastward last month to attend executive council meetings of the International Association of Electrical Inspectors. The council met at the Lake Shore Athletic Club in Chicago.

Ralph W. Wiley, chief of the department of electricity of San Francisco, headed a delegation from the Southwest. Mr. Wiley was appointed to the place on the executive council which became vacant upon the death of Claude W. Mitchell. With Mr. Wiley went George Kimball, electrical engineer of the California Industrial Accident Commission; R. H. Manahan, chief of the department of electricity of Los Angeles, and Carl Hardy, chief of the department of electricity of Oakland.

Northwest representatives were Fred D. Weber, chief electrical engineer for the Oregon Insurance Rating Bureau and secretary-treasurer of the Northwestern Section, I.A.E.I., Portland; Lou W. Going, chief electrical inspector for Portland and second vice-president of the I.A.E.I., and H. A. Patton, electrical inspector of the Washington Surveying and Rating Bureau, Seattle.

Following the Inspectors' meeting, Messrs. Weber, Going, Hardy and Manahan attended sessions of the Electrical Committee of the National Fire Protection Ass'n, of which all are members, and which also met in Chicago.

•

Fined for Pennies Behind the Fuses

Fined $100 in a police court for violating the electrical ordinance designed to safeguard the use of electrical appliances, R. B. Cobb, service station proprietor at San Diego, Calif., provided a test case for the local ordinance. More than that, he established the fact that the ordinance means business and that those who put pennies behind fuses may be subject to penalty.

Pennies were found by an inspector making a routine check in the electric fuses at the service station operated by Cobb. The court held that the pennies permitted passage of electric current and increased greatly the hazard of an electrical fire and constituted a public hazard.

•

• THE UTAH CHAPTER of the International Association of Electrical Inspectors, has become an actuality. Organized in Salt Lake City recently the group elected Hyde Stayner, of the Utah Power and Light Co., chairman, and Blaine Grey, chief electrical inspector of Salt Lake City, secretary-treasurer.

...in Construction

Subcontractors Meet to Curb Bid Shopping

AS a heritage of the NRA code, subcontractors in the various crafts of the construction industry are beginning to realize that mutual problems demand cooperation in order to arrive at solutions, it was pointed out by Mano Zan, coordinator for the California State Contractors License Board, at a recent meeting of the San Francisco Electrical Contractors Assn. He pointed out that employers in the various building trades groups are holding conferences looking for methods to bring back bid depositories and some self-regulation of business which will prevent the already recurring evils of bid shopping and other construction industry bad practices.

Wisconsin, it was pointed out, has adopted a recovery act which has been held constitutional by its supreme court and now has eleven industries operating under it with ten more requesting codes. Pennsylvania and Ohio were also declared to be studying this act with a view toward establishing similar acts in those states.

Mr. Zan also said that the Contractors License Board was studying the problem of qualifying contractors, since registration had shown that there are far too many contractors for the population. There are now registered one contractor for each 380 people in the state and of this number the percentage of electrical contractors is very high.

•

Knob and Tube Manual Tells Method Advantages

Designed to show constructively by factual information the place and necessity for knob and tube wiring methods in all types of installations other than those where the building construction requires a raceway (such as brick, concrete, etc.) the national association of Standard Electrical Porcelain Manufacturers has just issued an interesting and valuable manual to the trade. Made up in the form of a folding broadside, the interior spread, when unfolded, illustrates by drawings the methods of installing concealed knob and tube wiring and open cleat wiring under all sorts of conditions. These installation methods illustrate in a simple and understandable fashion the correct methods for installing this pioneer wiring system.

Other portions of the manual summarize the characteristics and advantages of porcelain, compare its cost of installation with other wiring methods, give general code information regarding approved methods of installation and economy reasons for using this system of wiring.

James Steel Mahan, secretary of the Standard Electrical Porcelain Manufacturers, 201 North Wells St., Chicago, offers additional copies of the manual to all contractors, inspectors, utilities and architects.

•

• CONSTRUCTION LEAGUE of the United States urges electrical contractors and others in the construction industry to write their congressmen and senators, bringing the facts before them relative to the confusion that exists over PWA and WPA. It is especially recommended that no further demands for appropriations be made but that a portion of the proposed $1,500,000,000 works fund be allocated to useful work under PWA. If $700,000,000 of this amount could be earmarked for PWA, on a 45 per cent grant basis, this would allow the construction of about $1,500,000,000 of PWA projects which would benefit the construction industry and all of the various groups dependent upon it for improved business conditions.

•

...in the Motor Shop

Motor Shop Starts "News Flashes"

Quality Electric Co., Ltd., has inaugurated a novel form of publicity with the first issue of "Quality Electric News Flashes," a four-page printed leaflet describing the company's services in each of its departments. It is stated in the first issue that the publication will be issued regularly to offer timely suggestions of practical everyday value to its customers and prospects.

Established in 1895, the company now has quarters at 812 South San Pedro St., Los Angeles, and is managed by Joe O. Case, formerly General Electric Co. sales manager. It is owned by a syndicate of electrical men of Los Angeles.

In the first issue services of the company listed include industrial power installations, industrial heating, industrial lighting, electrical repairs, instruments, instrument laboratory, sale of General Electric and Black & Decker products and tools, reconditioning of motors, transformer repairs and Rockwood pulleys and belt drives, as well as a transmission department for building power transmission, distribution and telephone lines.

News of Note + + +

Power Bonds Defeated 3 to 1 in Edison Town

Bonds in the amount of $295,000 to be used for the construction or purchase of a municipal distribution system at Lynwood on the lines of the Southern California Edison Co. were defeated by a majority of three to one in an election on April 14. A two-thirds majority was required for their passage.

Of particular significance was the fact that in opposing the proposition the utility company used its own employees to tell the story, signed its own name to circulars and advertisements. Points emphasized included the fact that the city was indebted to the extent of $257 per capita in bonds and assessments as compared to an assessed valuation of only $558 per capita and that general taxes were 30 per cent delinquent and assessments for improvement districts 40 per cent delinquent. It was also pointed out that the Edison company pays approximately $8,000 annually in taxes which accrue to the city.

●

Ickes Gets 20 Identical Boulder Dam Bids

Because twenty separate bidders offered identical bids for supplying insulated cable for the Boulder Dam power house, Secretary of the Interior Harold L. Ickes approved the bid of the company located farthest from Boulder Dam. Simplex Wire and Cable Co., Boston, was the successful bidder. Twenty concerns submitted identical bids of $111,208.75, offering identical discounts of $556.04 and other credits, also identical, sufficient to make the delivered cost $104,484.31 in each instance. Secretary Ickes said:

"When twenty companies in cities as far apart as Los Angeles, Butte, Denver and Boston, submit identical bids for the delivery of insulated cable at Boulder Dam, there is prima facie evidence of collusion. No person is so naive as to believe that this is coincidence or even friendly collaboration.

"I would like to reject all of these bids, but to do so would entail readvertisement of bids and long delay. The Government needs the cable for the first battery of generators. The City of Los Angeles is desirous of obtaining current as soon as possible. A delay of 60 days in the operation of the power house would mean a loss to the Government and a loss to Los Angeles. And even if I had thrown out the identical bids there would be no assurance that upon readvertisement the same thing would not happen again. The Bureau of Reclamation is eager to proceed with the work and has urged expeditious action. I have, therefore, accepted the bid of the company farthest away with a desire that additional employment would be opened by transporting the material involved to the site."

Twenty-six bids were received for various schedules under the original advertisement. It was on Schedule 2, principal item in the invitation, that twenty quoted the same price. Schedule 2 covered 421,850 linear feet of 500-volt, 1,000-volt and 600-volt rubber insulated cable. No others bid on Schedule 2.

Simplex Wire and Cable Co.'s bid also was accepted for Schedule 4, which calls for a small amount of rubber and asbestos insulated cable. The low bid was submitted identically by 21 companies of which all but one offered identical credits and penalties and had identical low delivered costs of $4,214.42.

Schedules 1 and 3 involved small amounts of 5,000-volt varnished cambric insulated cable and inclined cable. Combination bids were acceptable on these. The bid submitted by Lavenson and Savasta of San Francisco for a delivered cost of $7,844.61 was accepted.

●

Dismissal of Appeal in Idaho PWA Case Asked

Not wishing the Coeur d'Alene PWA municipal power project to go to the Supreme Court as a test case on the constitutionality of the use of PWA funds, the City of Coeur d'Alene, Idaho, and Secretary of the Interior Harold Ickes have joined in a petition asking dismissal of their appeal from a previously granted permanent injunction. Petition asking dismissal was to the Ninth District Circuit Court of Appeals, where appeal from the permanent injunction, granted by Federal Judge C. C. Cavanah at the request of the Washington Water Power Co., had been filed.

Previously Secretary Ickes had asked power companies fighting such projects to expedite their cases to the Supreme Court so that the question might be settled. Remand of the case was asked to allow drawing of a new contract which would not give the government control over the Coeur d'Alene rates.

The Coeur d'Alene case is one of those in which the constitutionality of granting PWA funds to build power systems in districts already served is questioned. In this case, PWA would make loans and grants totalling $650,000 to the city for construction of electric and water systems to compete with those of the Washington Water Power Co.

Federal Ruling Means Big Expense to San Francisco

Rejection by Secretary of Interior Harold Ickes of plans submitted by the City of San Francisco for distribution of its Hetch Hetchy power last week placed upon that city the burden of spending a probable $27,000,000 for a municipally owned distribution system.

The secretary's decision was a sharp disappointment to city officials, who had hoped to save more than $8,000,000 for San Francisco taxpayers by distribution through existing facilities of the Pacific Gas & Electric Co. The secretary said no arrangement could be entered into for distribution of the power over privately owned facilities.

Under terms of the Federal grant by which the city acquired its power sources, Secretary Ickes held five of the distribution proposals submitted to be in violation of the Raker Act. A sixth proposal, by which the city would purchase its own system, the Secretary indicated to be acceptable.

Plan 4, typical of those rejected, provided for sale of the power to P. G. & E. at Newark, and for repurchase in San Francisco of enough power to serve most of the city's consumers.

The Secretary said: "I cannot conscientiously hold that the act would be complied with reasonably if a plan should be agreed upon whereby approximately 45 per cent of the entire amount of Hetch Hetchy energy delivered at Newark would be conveyed to the Pacific Gas and Electric Co. for sale by it to customer-consumers in direct violation of the provisions of Section 6."

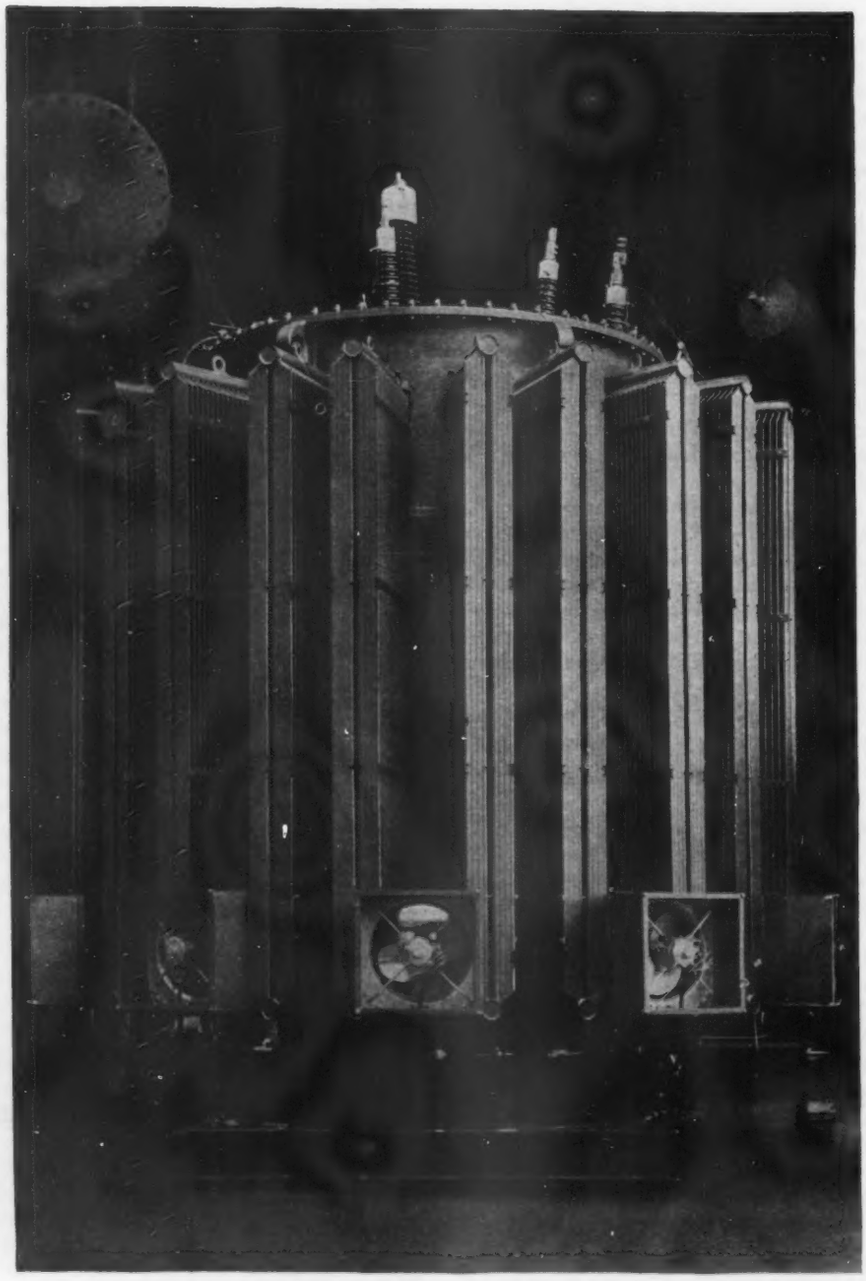
Glass Insulator Factory Opened on Coast

Maydwell and Hartzell, Inc., San Francisco and Los Angeles, have announced that they have recently completed arrangements for the manufacture of glass insulators to be marketed under their trade-mark and the trade name "*Maydwell*" glass insulators. The new line of insulators, designed for telegraph, telephone and low voltage distribution circuits, will be manufactured in the plant operated by the Crystalite Products Corporation, Glendale, Calif.

This will be the first glass insulator manufacturing operation west of the Mississippi river. Special modern machinery has been installed in the Crystalite plant for the production of the new line, the latter concern having had many years of experience in the manufacturer of illuminating and technical glass products used by the industry.

Of course, it's good!

It's made of good sound steel



AMERICAN Electrical Steel Sheets are used by so many manufacturers because of their uniform quality, flatness, non-aging properties and good electrical efficiency. Attention is given to every detail which may aid the electrical engineer and manufacturer of electrical equipment.

Naturally no one grade of sheet fits all applications. Therefore, we manufacture:

American Transformer and Radio Sheets in several grades for transformers and certain types of high efficiency motors and generators.

American Dynamo and American Motor grades are well suited for generators, motors and some transformer designs.

American U. S. Electrical is standard for the general run of motors and is supplemented by:

American Armature, a lower grade much used in fractional horse power equipment where inductions are higher than average.

Our Electrical Sheet Division is at your service to help you solve problems dealing with the use of Electrical Sheets. Our literature may help you. Send for it.

(PHOTO COURTESY ALLIS-CHALMERS MFG. CO., MILWAUKEE, WIS.)

AMERICAN ELECTRICAL SHEETS

COLUMBIA STEEL COMPANY · *San Francisco*

Pacific Coast Distributors of Electrical Sheets for American Sheet & Tin Plate Company

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

Tri-State Meet Hears Farmer-Built Line Plan

Rural electrification and development problems in the Northwest were minutely discussed at a recent tri-state conference in Walla Walla, in which 60 rural electric leaders, including representatives from utility companies, from the state colleges and from state C.R.E.A.s of Oregon, Washington, and Idaho, took part.

The conference was informal in character with a minimum of written papers. Programmed subjects were opened by assignment to certain delegates after which these subjects were informally discussed in round table manner.

Interest centered on The Washington Water Power Co. policy of allowing groups of farmers to build their own lines. Ralph Guse, of that company, explained that under this system the prospective customers do practically all the work in the off season of the year and pool the out-of-pocket expense for materials and expert lineman labor. Hauling and similar items of expense are furnished by the farmers own trucks and not charged against the cost of the line. Superintendence is furnished by the company free. Under this method of construction, the cost of lines exclusive of transformers and meters, which are installed by the company, has run from $350 to $450 per mile.

Other subjects discussed were feed grinding, irrigation, farm refrigeration, fruit and nut drying and processing, hot-bed heating, soil sterilization, brooding with particular reference to air conditioning of the brooder and incubator rooms, and the new state wiring codes of Oregon and Washington.

The conference was held under the auspices of Washington State College, Pullman, with L. J. Smith head of the agricultural engineering department of that college as chairman. Others acting as chairmen of the various sessions were D. B. Leonard, Pacific Power & Light Co.; F. E. Price, Oregon State College; and Hobart Beresford, University of Idaho.

•

• WITH PREPARATIONS for arrival of Boulder Dam power in Los Angeles going forward rapidly, the largest foundation ever constructed by the bureau of power and light is being poured at Wilmington receiving station to accommodate the frequency changer which will raise frequencies from 50 to 60 cycles.

•

• SPOKANE'S chamber of commerce resolved to take no action on the Columbia Basin report of the Pacific Northwest Regional Planning Commission in connection with the question of creating a Federal Columbia Valley Authority.

The Standard News

May 1936 — **Electrical Edition**

Published by THE STANDARD ELECTRIC STOVE CO., Toledo, Ohio

STANDARD'S System

The principle of the Standard operation is to design and build its own product in its entirety. This has been going on for over a quarter of a century. Standard has never made anything but electric ranges and has no background of other types of construction. We are therefore unhampered by tradition.

Building all our own parts, finishing and completing them in every respect, has led us to expect initiative from our force. Every one connected with Standard, every one who can make a decision on a vital point, is able to do so through his years of experience. All viewpoints are considered, including sales force.

Our sales force can cook. We don't ask them to go around all over the country cooking meals, but they *can do it,* and what is more they can teach users how to cook. They know their Standards. In the successful operation of a business, there is no substitute for knowledge of that business and the product. In sales work, knowledge of the product comes first. Salesmen must know every minute detail of the product and know the why of it. The Standard man who calls on you is an expert. He was picked because of his brains, he was trained to know his product, and he can help you and your salesmen. His sole object when he calls on you is to establish and maintain business relations which will be mutually pleasant and profitable, for only through such relationships can business grow and prosper.

The Valley Queens

This shows the new Valley Queen, four burner range. This is a very complete four burner range, also made with three

surface burners. Note the ornament in the back splash. The one on the left is the front opening vent from the oven. The switches are recessed, an exclusive idea with Standard.

The balanced oven is a marvel of perfect operation. It bakes and browns perfectly on all shelves and front and back. Note the indicating control. The control indicates the temperature at all times, from low to high. You set the temperature and you can tell whether or not it is there by looking at "degrees".

The smooth, beautiful finish is Standard's own. All done right in our own plant under the supervision of experts. It must be flawless or it will not suit.

The especial feature of the Valley Queen ranges is that they will fit into limited space. Each is only 40 inches left to right. Be sure to show this beautiful model on your sales floor or in your window.

STANDARD—the Complete Line

People who really get acquainted with Standard and the product wonder at its comprehensiveness. A large range selling for $2100.00 for a Palm Beach home. A big sturdy impressive looking bulk of a range for a sea-going vessel. Its every characteristic suggests strength. A large two-oven commercial range for a golf club. Another for a college fraternity house. Some griddles and bun warmers for barbecues. Hundreds of 421A, B, and Cs for apartments. Water heaters in all sizes, some going to north, some to the west, south and east. And here are several coffee urns, going to hotel supply companies.

That just illustrates how we can serve you. You don't need any other line of cooking and heating appliances. Standard can take care of your needs.

Surface Burners

The cooking top equipment on an electric range is one which is very interesting. You know, on a Standard there is no extra cost for the enclosed KALMAX burner. What is the Kalmax? Standard has made enclosed burners for twenty-five years and the KALMAX is the climax of this development. Write for the story "THE HOW AND WHY OF SURFACE BURNERS".

Your inquiry will be promptly answered. Address THE STANDARD ELECTRIC STOVE COMPANY (Dept. C) Toledo, Ohio, U. S. A.

Edison and P.G.&E. Sign Interchange Contract

PLANS for the interchange of large blocks of power between the Southern California Edison Company and the Pacific Gas & Electric Company through revised and reinforced interconnections between the two systems were announced April 23 by Fred B. Lewis, vice-president and general manager of the Edison Company, and P. M. Downing, vice-president and general manager of the Pacific Gas & Electric Company.

Completion of the interconnections, tentatively set for July of next year, will provide for the ready absorption into the Edison system of a large portion of its allotment of power to be generated at Boulder Canyon dam when the company's contract with the government for Boulder Dam power becomes operative. The project removes the possibility of surplus generating capacity formerly faced by the Edison Company and obviates the necessity of either of the two companies making further capital investments in plant capacity while either has any surplus capacity which can economically be transferred through the new interconnections. The Edison Company will be enabled to utilize Boulder Dam power in its Southern California system, thus making available to the Pacific Gas & Electric Company a portion of the generating capacity of the Edison Company Big Creek-San Joaquin River hydro plants.

In an application filed with the California Railroad Commission in San Francisco the companies asked approval of an agreement to construct large capacity interconnecting lines in the San Joaquin Valley, where transmission lines of the Edison Company and the San Joaquin Light and Power Corporation, subsidiary of the Pacific Gas & Electric Company, are in close relation. Work on the various phases of the interconnection is to begin immediately following approval of the agreement.

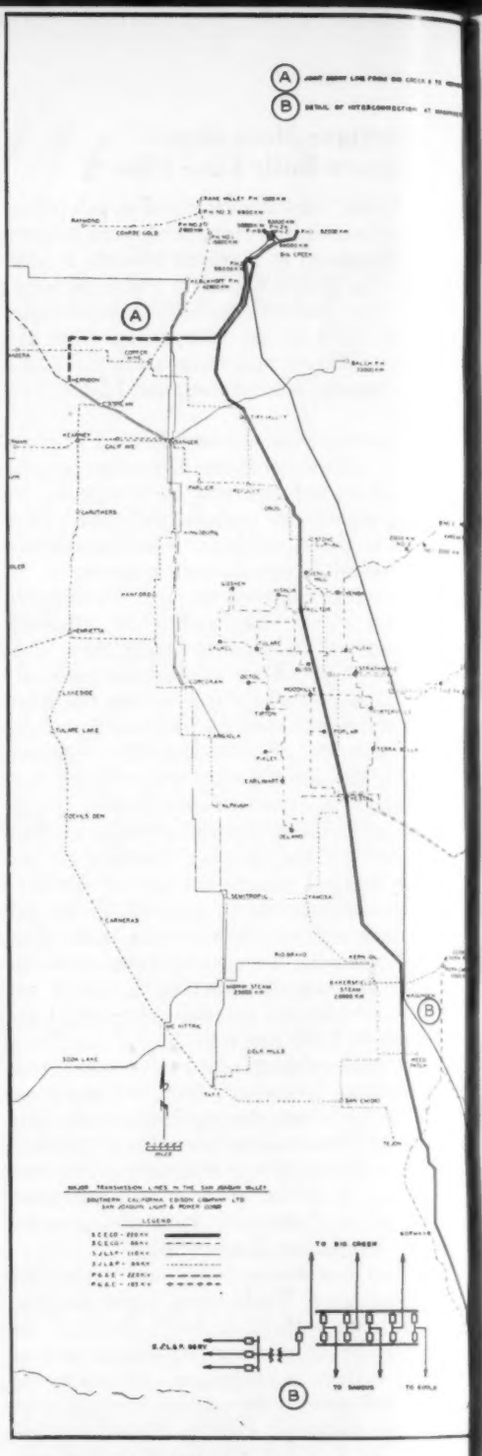
When the new interconnection is completed the Pacific Coast will be supplied with a continuous network of high voltage transmission lines extending from the Mexican line to the Canadian border. The result will be increased protection in every territory against emergency demand for power and greater flexibility in the employment of reserve capacity by interchange of power between the producing companies. The coast utilities, particularly in California, have been interconnected for many years but the rapid growth of load additional connections are required between the northern and southern systems.

"Sometime this year power is expected to come in from Boulder Dam to be utilized by the City of Los Angeles, and displacing the power now supplied to the City by the Edison Company, leaving some surplus generating capacity in the Edison Company's system for which it has no immediate use," Mr. Lewis said. "At the same time the Pacific Gas & Electric Company system has grown to a point where additional generating capacity soon will be needed, and probably would be provided by construction of an additional steam plant. These two conditions, with the other important factors involved, led to the agreement now before the Railroad Commission.

"Initially the power interchanged will amount to 52,000 horsepower and this will be increased according to the requirements of the Pacific Gas & Electric Company and the ability of the Edison Company to supply. While the movement of energy probably will be from the Edison Company to the Pacific Gas & Electric Company for some time in the future, conditions may readily be reversed so that the Edison Company can receive power from the Pacific Gas & Electric Company.

"The plan has numerous advantages but it is particularly desirable for the operating economies it will effect. Fixed charges for new capacity will be avoided by the Pacific Gas & Electric Company and similar charges for idle existing capacity will be saved by the Edison Company."

The San Joaquin Light and Power Corporation, a Pacific Gas & Electric Company subsidiary, operates in an area in the southern San Joaquin Valley traversed by the Edison transmission lines. It is proposed to establish a connection of 80,000 horsepower between the Edison Company's substation at Magunden and the San Joaquin Light and Power Corporation substation at Oil Center, northeast of Bakersfield. Consideration also has been given to connecting a loop line of the San Joaquin's system between Oil Center and the Edison Company plant on the Kern River. In this way surplus power from the Edison system can be delivered into the southern end of the San Joaquin system, releasing a similar amount of power from the Pacific Gas & Electric Company's northern supply. The plan also proposes a high tension transmission (220 kv.) line between the Edison Company's Big Creek No. 3 plant on the San Joaquin River and Herndon. The latter point is the southern terminus of the Pacific Gas & Electric Company's 220,000 volt transmission system. Herndon is about fifteen miles north of Fresno and the line to Big Creek No. 3 would be approximately 38 miles. This new connection will be of sufficient capacity to allow the transfer of 280,000 horsepower of electric energy.



Major transmission lines in the San Joaquin Valley showing interconnections, (A) and (B), between the Edison and P. G. & E.—San Joaquin systems. The initial connection will be at (B), the Edison substation at Magunden and the San Joaquin station at Oil Center

No physical change will be required in the Edison Big Creek plants, which were initially designed to operate at either 50 or 60 cycles, changes in the governor settings permitting operation at the frequency selected.

ELECTRIC HEATING IS SWEEPING AHEAD

NOTHING CAN STOP IT NOW!

Where a basic principle is correct, universal acceptance is not far behind.

Wesix Automatic Electric Heating, long offering fundamentally correct principles of heating, has already triumphed—because the Wesix methods are right.

Thousands of successful Wesix Electric Heating installations in all parts of America today testify to the Wesix double-action heating principle, its simplicity and economy for heating homes, schools, hospitals and large buildings. Uncle Sam verifies this by using Wesix Electric Heaters in his model towns.

IT'S HERE!

Perfected ELECTRIC HEATING by WESIX

BEFORE YOU INSTALL ANY HEATING SYSTEM

. . . ask us about WESIX *automatic* electric heaters—proven in thousands of installations in homes, buildings, hospitals, schools—even entire cities! WESIX patented double-action principle of *circulating* and *radiating* provides quick, efficient, economical heat. You know it's healthful. NO FANS to stir up breeze and drafts—no moving parts. And now guaranteed 5 years against burnout! COME IN FOR NEW LOW-COST RATES.

Two of the ads in the 1936 Wesix Sales Plans for Utilities and Dealers for the coming season and for present new building activities. Send for mats.

THE EXPERIMENTS ARE OVER

IT'S HERE!

Perfected ELECTRIC HEATING by WESIX

LOWER RATES ALSO SUGGEST... INVESTIGATE!

Every heating engineer has always admitted that some day all space heating would be done — *electrically!* That day is here! The experiments are over. Lower rates make it economical. WESIX *automatic* electric heaters make it practical! . . . WESIX heaters already have successfully and economically heated homes, buildings, hospitals, schools — even entire cities. Patented, proven double-action principle circulates and radiates heat quickly and uniformly. Every room automatically maintained at desired temperature. Imagine! no soot, no fumes, nothing to rob oxygen or vitiate atmosphere . . . WESIX heaters have NO MOVING PARTS — no fan to create breeze or draft — nothing to get out of order. Guaranteed 5 years against burnout.

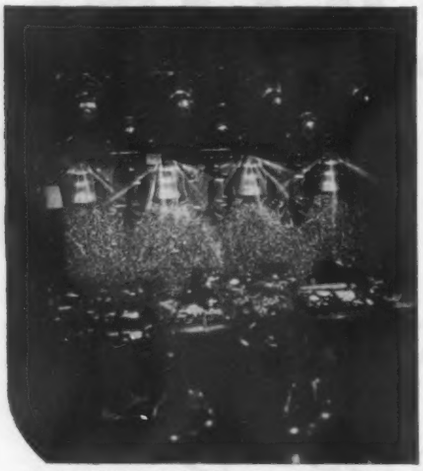
ND-3602

Investigate the WESIX utility and dealer helps, tested sales plans. Make more money, earn more revenue, have more wiring jobs selling the accepted Wesix Automatic Electric Heaters.

WESIX ELECTRIC HEATER CO.

390 First St. San Francisco
631 San Julian St. Los Angeles
2008 Third Ave. Seattle

THIS MACHINED BALL-SOCKET



IS FURNISHED ONLY IN A FORGING

Where uniformity is vital to strength, no engineer will question the superiority of a machined seat, for such machining in combination with a forged ball-stud produces a joint of uniformity and precision.

Consider then, the advantages of such a seat, machined to perfect alignment. The Engineer with an eye to uniform and rapid field assembly will readily appreciate this factor.

Insist on forgings—*They* will prove the most economical in the long run.

THE BREWER-TITCHENER CORPORATION

Cortland, New York

Through Your Insulator Manufacturer Only

BTC

FOR RELIABILITY, INSIST ON A FORGING

A.I.E.E. Prepares for National Convention in Pasadena

Plans have been completed for the national convention of the American Institute of Electrical Engineers to be held at Huntington Hotel, Pasadena, Calif., June 22-26, inclusive. It is expected that several hundred delegates from all over the world will attend this important meeting of the Institute which will provide, in addition to a fine technical program, an unparalleled opportunity to view projects embodying the most advanced engineering.

Included in the latter will be a trip to Boulder Dam, a trip to Mt. Wilson observatory, inspection of the works of the Metropolitan Water District, a trip through the two large receiving stations of the Los Angeles Bureau of Power and Light associated with the Boulder Dam development, inspection of various substations of the Southern California Edison Co. Ltd. and others.

A well rounded program of entertainment, including golf, tennis, swimming, bridge and other diversions, promises to make the five-day meeting as enjoyable as it will be instructive. Ladies who attend will find that the days have been planned to show them practically all of the interesting and beautiful spots in southern California.

The complete program, including the technical papers, will be published in the June issue of ELECTRICAL WEST. The annual Pacific Coast convention of the A.I.E.E. will be held in conjunction with this national meeting this year. The usual speeches of the annual Pacific Coast convention have been incorporated in the program of the five-day conclave.

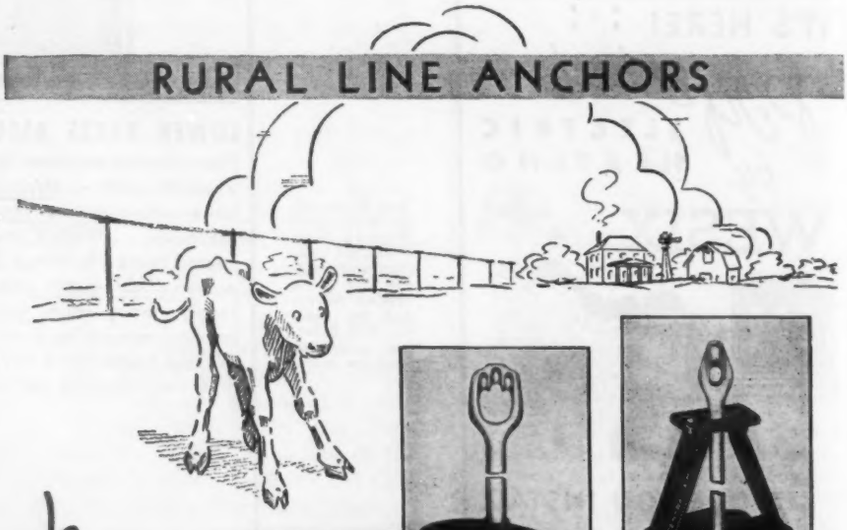
•

• PACIFIC GAS & ELECTRIC CO. has received approval from the Federal Power Commission for transfer to the company of licenses for the Stanislaus-Spring Gap project of the Sierra and San Francisco Power Co., the Caribou project of the Great Western Power Co., and for projects operated by the Feather River Power Co. and Mount Shasta Power Corp. All are subsidiaries of Pacific Gas & Electric.

•

• THIRTIETH ANNIVERSARY of the Grays Harbor Railway & Light Co., Aberdeen, Wash., was celebrated this year at a dinner which assembled more than 100 of the company's employees. J. R. Snider, vice-president and general manager, acted as toastmaster, and presented electric clocks to 14 employes who had been with the company more than twenty years.

RURAL LINE ANCHORS



New DEVELOPMENTS

Here are three new contributions to rural line building by the WORLD'S LARGEST ANCHOR MANUFACTURERS.

FOR RURAL ELECTRIFICATION

These anchors have been developed to meet the need for inexpensive anchors with sufficient holding power for light rural lines. They are powerful in pull, durable, light weight and well constructed.

Write for circular describing them in detail.

ORDER FROM GENERAL ELECTRIC SUPPLY CORPORATION

ABC INDUSTRIES

A·B·CHANCE CO· CENTRALIA MISSOURI

GENERAL ELECTRIC
makes another stride toward
BETTER LIGHT

WITH General Electric's announcement of substantial price reductions in the higher wattage types of MAZDA lamps, effective May 1st, another important step is taken toward the goal of Better Light for Better Sight. It is the eighteenth major reduction in MAZDA lamp prices in fifteen years.

This most recent reduction in higher wattage lamp prices definitely paves the way for far greater residential and commercial lighting service. Closely tied in with the tremendous impetus to lighting created by practical applications of the Science of Seeing, this step offers utility executives an opportunity for still greater expansion of lighting promotion and revenue.

Putting the 100-200-300-watt Indirect Three-Lite bulbs in three-light lamps . . . filling empty sockets . . . replacing burned out lamps . . . putting on your lines the higher wattage lamps that everyone wants... placing plenty of spare lamps in every retail store, factory, and home . . . are some of the immediate opportunities for increasing lighting loads now afforded by these new low prices on higher wattage MAZDA lamps made by General Electric.

These price reductions are another big step toward our mutual goal . . . to bring up lighting standards to the necessary requirements for safe and easy seeing. General Electric Company, Nela Park, Cleveland, Ohio.

ISN'T IT GOOD LOOKING AND IT COSTS SO LITTLE
THIS IS WHAT I CALL REAL READING LIGHT
NEW LOW PRICES
(Effective May 1st)
Watts Type Was Now
150 Clear, Inside Frosted 35c 25c
200 Clear 55c 45c
300 Clear 90c 75c
500 Clear $1.55 $1.40
150 Clear Daylight 65c 50c
200 Clear Daylight 90c 80c
300 Clear Daylight $1.35 $1.20
500 Clear Daylight $2.30 $2.15
50 100 200 Indirect Three-Lite 80c 60c
100 200 300 Indirect Three-Lite $1.00 80c

● *Approximately 147,000 Three-Lite floor lamps were sold last year. These alone constitute a good potential replacement market for* MAZDA *Indirect Three-Lite bulbs at the new low prices.*

GENERAL ELECTRIC

Oregon Body Doubts Wisdom Of Forming Utility District

Feasibility of the proposed people's utility district in Linn County, Ore., is considered doubtful in a report issued by the State Hydro-Electric Commission. Serving every possible customer in the district with Bonneville power purchased at 5.42 mils per kw.-hr. would not be economically justifiable, the commission found. On the other hand, an alternate project serving 35 per cent of the customers not now served would show excess income over cost at the present rates.

The Commission posed the following question: "Is it probable that the people of this territory can, through the formation of a district, benefit themselves by securing either lower rates, or better or more widespread service without increasing rates?" The report indirectly answered this question in the negative, but concluded: "If an election is held on the question of forming the district, and election of directors thereof, no bond issue or question of policy in the matter of acquisition or construction of an electrical distribution system would be involved. Should the district be created, an organization would be available for making a complete investigation of the possibilities of acquiring electrical facilities. This report is here presented for the consideration of those interested. The decision as to whether or not the district shall be formed must be made by the people of the territory."

The report found the reproduction cost new less depreciation of the existing electrical facilities in the district operated by the Mountain States Power Co. to be $1,309,000. This company serves 4,011 urban customers, and 1,240 rural customers with 235 miles of rural line. It found that the cost of the distribution system alone, designed to serve all customers in the district would involve 580 miles of new line making service available to some 2,000 additional customers, and would cost $1,234,000. Assuming the district could secure 80 per cent of these new customers, and that these customers would use power in about the same quantity as present customers do, and at the same average rate, and then estimating annual fixed charges on the total indebtedness including amortization at 4 per cent over a period of 20 years beginning with the fifth year, plus annual operating charges, results showed a deficit of approximately $14,000 annually.

The report cautioned the people of the district against attempting to operate a competing system, stating it would be sounder from an economic standpoint to acquire the existing facilities, and in this connection referred to the fact that severance damages would probably be allowed on account of that part of the company's system lying in the district that it would not be necessary for the district to purchase.

Analyzing the second project requiring the building of only 220 additional miles of distribution line to serve 815 additional customers, and using the same assumptions as to use and rates, the project figured a surplus of $12,000 annually.

The district would be formed by popular vote after a petition by 5 per cent of the registered voters had placed the measure on the ballot.

Merger Permits Granted in Idaho

Two Western mergers were made possible last month when the Federal Power Commission announced approval of two applications for merger and sale of facilities filed by subsidiaries of the Electric Bond & Share Co.

The Idaho Transmission Co. was authorized to sell all of its existing facilities to The Montana Power Co., which at the time of filing the application owned practically all outstanding capital stock of the Idaho company. Authority was also granted the Nevada Power Co. to sell all its facilities to Idaho Power Co.

When you NEED a fuse link

or a 1200 AMPERE SAFETY SWITCH!

TYPE "C" COLT-NOARK DUALBREAK SAFETY SWITCH—575 VOLTS

You'll find them Both in the New

COLT-NOARK LINE

There's a big advantage in being able to furnish your customer with a complete line — everything from a fuse link to a 1200 ampere Safety Switch — all bearing the same nationally known trade-mark — all backed by an organization that has been producing products of outstanding efficiency — for exactly 100 years. The new Colt-Noark line includes Type A, C and D Safety Switches . . . Weather-proof Safety Switches . . . Meter and Service Entrance Switches . . . Service Equipment . . . Motor Starting Equipment ranging from Push Button Stations up to Combination Motor Starters and Safety Switches . . . Fuses and Fuse Accessories . . . Cast Iron Service and Fuse Boxes . . . and the New Protectit Auxiliary Circuit Breaker.

What a line — what an opportunity for you to increase your profits by stocking just one line — a line that is well known . . . well advertised . . . well serviced!

CATALOG 58-S

Send for your copy of Colt-Noark catalog 58-S. Contains descriptions and specifications of Safety Switches, Meter Service and Entrance Switches and Motor Starting Equipment. Ask for a copy.

ELECTRICAL DIVISION

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn.

H. B. SQUIRES CO., Pacific Coast Representative

COLT-NOARK

SWITCHES - MOTOR STARTERS - FUSES

PRIVATE TELEPHONE SYSTEMS

Complete Systems From $12 Up

Here's a *new market*—a *new source of profit*-

for the electrical merchandiser!

One of the world's largest telephone manufacturers has recently perfected a plan whereby electrical wholesalers, dealers and contractors can participate in the sales of its nationally-advertised private telephone systems on a very liberal basis!

These private communication systems include not only the well-known Strowger P-A-X (Private Automatic Exchange) for large business and industrial plants, but also the newer Autelco Intercom. and Serv-U-Fone Systems, which in both size and price appeal to the small professional and business offices and residences of all types. Thus systems can be furnished for from 2 to 2000 telephones, and more, at prices beginning at $12.

Every alert electrical wholesaler, dealer or contractor will want to know more of this plan. Write—today—for full details.

[Autelco Private Telephone Systems are designed for private service. They cannot be connected with the public telephone system.]

American Automatic Electric Sales Company

1033 West Van Buren Street, Chicago

Los Angeles
555 S. Flower St.

San Francisco
235 Montgomery St.

Water in Plenty Predicted For California Streams

With the Sierra and Nevada blanketed under thick snow packs, California's department of public works, in its cooperative snow survey, reported a favorable outlook in forecasting stream flow in the State. Forecast of the department, contained in its April bulletin, is based on all available data to April 1 for all mountain stations of the U. S. Weather Bureau, State, districts and utilities.

Snow pack in excess of normal was reported in most watersheds, particularly in higher altitudes. Lightest is in the northern part of the State: the Upper Sacramento-McCloud-Pit area reporting only 76 per cent of normal and the Feather but 68 per cent. With these exceptions, all western-slope basins of the Sierra vary between 95 and 118 per cent of normal, based on the 40-year mean.

Precipitation stations report averages from 2 to 30 per cent above normal for all streams lying above the Kern, excepting the Feather River basin, which is at 95 per cent of normal.

Estimated stream flows are generally close to those of last year. Minimum mean for a 10-day period in the combined flow of the Sacramento and San Joaquin rivers at the Delta is estimated at 4,100 sec.-ft., compared to a recorded 3,940 sec.-ft. for last year, 1,530 sec.-ft. for 1934.

•

Service Restored After Stop by Strike

Residents of Ione, in northeastern Washington, are again enjoying electric service after being without electricity for more than a month, due to a strike by employes of the Panhandle Lumber Co., owner of the Ione Light and Water Co. Over a month ago the supply of cordwood, used as fuel for operating the small steam plant at Ione, became exhausted. Workmen thereupon refused to handle cordwood coming from the company's mill at Spirit Lake, Idaho.

Failure of the strikers and the mill management to effect a compromise brought Walter Watson, representative of the Washington Department of Public Service, to the scene. Later Frank Purse, State supervisor of utilities, conducted negotiations with John Dimeling, president of the Panhandle Lumber Co. The company thereupon purchased a diesel auxiliary plant, which was installed April 16.

•

• CONSOLIDATION of operations of the West Canadian Hydro-Electric Corp. and the Okanagan Telephone Co. has been effected. Headquarters for both concerns are now in the same building, Seventh St., Vernon, British Columbia. West Canadian's offices in the Parkhurst Block have been closed.

Save Outages During Lightning Season

WITH S & C UNIVERSAL LINKS

Actual records of several operating companies covering a period of six months including the lightning season, revealed amazing savings in time, money, and annoyance on loads protected by S & C Fuse Links.

Various makes of links were installed—but operations were vastly different . . . NOT ONE S & C Link caused a circuit interruption because of improper blowing—NOT ONE unnecessary outage.

HERE'S WHY

The metal sleeve around the fuse wire on S & C Links of 1 to 10 amps. actually acts as a surge gap and prevents the blowing of the fuse because of surges. There's the answer to troubles during the lightning season.

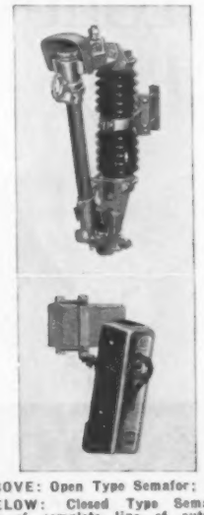
Let S & C Fuse Links save outages for you, too. They are the only links that can be used in ANY make of cutout—they are strong, safely stored—have no soldered contacts. The "spring-in-tension" mounting insures a quick break . . . other sizes, 15 to 100 amps.

ORDER NOW — THEY COST NO MORE

SCHWEITZER & CONRAD, INC.

4435 Ravenswood Ave., Chicago

Western Representatives: San Francisco: George E. Henn, 420 Market Street; Los Angeles: Farnham & Cunningham, Edison Bldg.; Seattle: T. S. Wood, 220 Ninth Street, N; Salt Lake City: Ambler & Riter, Kearns Bldg.



ABOVE: Open Type Semafor;
BELOW: Closed Type Semafor; two of complete line of cutouts. Ask for Bulletin No. 215-A

WHERE TO BUY . . . IN THE WEST

LAPP
LINE POST INSULATORS

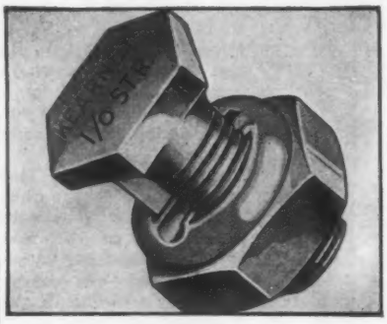
Lapp Line Post Insulators eliminate radio interference due to both dirt and electro-static conditions.

★

Write for Bulletin No. 123 describing and cataloguing these insulators.

LAPP INSULATOR CO., Inc.
Le Roy, N. Y.

KEARNEY
CON-NEC-TITES
for Better Connections



Smooth, rounded corners — no sharp edges — full round washer — only two pieces to handle — made of brass, bronze or copper — full range of sizes.

JAMES R. KEARNEY CORPORATION ST. LOUIS, MO.

Underground Transmission
Without Conduit

Note the air and moisture proof flexible coverings. Sealtite represents a distinct advance in parkway cable construction. It is more pliable than any other underground cable . . . and costs are considerably lower.

Write for booklet offering suggested uses and explaining long life.

SEALTITE
Parkway and Airport Cable with Maximum Flexibility by
PROVIDENCE

LOCUST PINS

. . . . . Oak Brackets *and* Pole Steps
Safety—Strength and Lasting Economy
LOCUST PIN CO. — Front Royal, Va.

MAYDWELL & HARTZELL
INCORPORATED
FACTORY DISTRIBUTORS
LOS ANGELES SAN FRANCISCO

Oregon Hunts Possible Loads for Bonneville

Electro-chemical and electro-metallurgical loads are advanced as big potential loads in a significant report issued by the State Planning Board of Oregon. The report is the first step in an investigation of possible uses of Bonneville power.

Prepared by the advisory committee on power, headed by J. C. Stevens, Portland consulting engineer, the report cites more than 300 articles and other reports as sources of material. It suggests further fields of research.

In connection with the chemical and metallurgical loads the report urges a long-range program of surveying the mineral resources of the state and an "immediate investigation and examination of some of the more important known or reported occurrences of economic minerals, some of which are iron deposits, limestone and dolomite, sodium, potassium, borax, aluminous clays, tungsten, chromium, manganese, vanadium and silicon."

Additional recommendation for further study is on the subject of inter-connection with existing power systems, since the characteristics of the Bonneville development will be seasonal, with reduced capacity coming at the time of high water in the Columbia when hydroplants of existing systems are capable of their maximum output.

In addition to the electro-chemical and electro-metallurgical possibilities, the report urges a study of the use of power for irrigation and drainage and cites highway lighting which, although somewhat limited in power-demand, offers possibilities, due largely to the recent development of sodium lamps. Not overlooked is the expansion of the ordinary industrial, commercial, domestic and rural uses.

•

• MUNICIPAL HYDRO-ELECTRIC GENERATION in Vancouver, British Columbia, will be outlined in concrete form by the financial group backing the proposal, following request for such material by the city council. Rumors of such a plan have persisted for six months. The financial group is one said to have backed many similar ventures in the United States.

•

• EMIGRATION CANYON, Utah, will receive power from Utah Power & Light Co. as the result of permission granted to the company and the Zions Security Corp. by the public service commission to construct line into the region. Running out of Salt Lake City, the extension will be completed early this summer at an estimated cost of $5,385.

...about People

General Electric Reorganizes Pacific Coast District

Effective April 1, the General Electric Co. divided the Pacific Coast into two separate areas. A. S. Moody is now manager of the Northwestern District consisting of Oregon, Washington and a portion of Idaho. R. M. Alvord, manager of the newly formed Pacific District, which consists of California, Arizona and the western portion of Nevada.

R. M. ALVORD

J. A. Cranston, Pacific Coast vice-president, continues in executive charge of both districts with headquarters in San Francisco.

Both of the new district managers have been active in the electric industry on the Pacific Coast for many years. Mr. Alvord graduated from Iowa State College in 1904, entered the General Electric test course immediately thereafter and was transferred to San Francisco in 1906 as a salesman. He has held various executive positions with the company since that time and in 1926 was made manager of the San Francisco office, which position he held until his present promotion.

A. S. MOODY

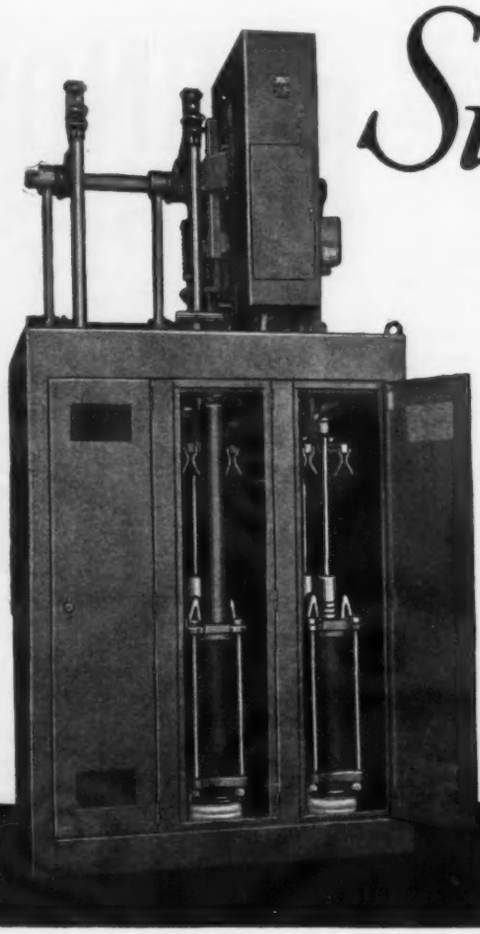
Mr. Moody is a graduate of the University of California and also went through the test course at Schenectady. He was transferred to the San Francisco office in 1908 and to the Seattle office of General Electric a year later. He was transferred to Portland in 1911 and assumed the position of manager of the supply department and later became assistant manager of the Portland office. In 1923 he was moved to Los Angeles as manager of the G.E. office in that city and one year later transferred to Portland with the title of northwestern manager in charge of the Portland, Seattle, Spokane and Tacoma offices. It was from the latter position that he was promoted to manager of the Northwestern District.

•

• D. D. MOFFAT, JR. has been appointed sales superintendent for Utah Power & Light Co. at Provo, Utah. He has been with the company since 1929 in various sales capacities.

•

• WILL T. NEILL, for fifteen years supervisor of rate and regulatory matters for the Pacific Power & Light Co., Portland, was elected vice-president of that company at the regular monthly meeting of the Board of Directors, April 9.



Since 1898

Type FH Breakers Have Been Preferred for Station Service

More than 30,000 are now in service. The list of users is a roll call of central stations and large industrials. This breaker set its own standard and grew with the industry's demands. General Electric, Schenectady, N. Y.

Important Improvements

1903 Explosion-chamber principle applied
1913 Tanks made easily removable
1919 Separating chamber and oil-tight features added
1930 Trip-free motor operating mechanism introduced
1931 OIL-BLAST added

AND NOW

Silver current-carrying contacts — reduced maintenance
Mechanism improvements — reduced operating time
Increased insulation strength—greater electrical safety

860-22D

GENERAL ELECTRIC

BRASS BUSHED
for greater strength

•

Hemingray Adds to its Long List of Advantages

1. Brass bushed smooth threads for insulator pin.
2. Greater mechanical strength.
3. Sustained high dielectric strength.
4. Unaffected by sudden temperature changes.
5. Withstand maximum insulator pin expansion.
6. Never age or deteriorate.
7. Controlled uniformity of product.
8. All surfaces impervious to moisture.
9. Tougher—withstand rough handling.
10. Clear and flawless for easy inspection.

Owens-Illinois Glass Company, Hemingray Division, Muncie, Ind.

HEMINGRAY Glass INSULATORS

In Irons

Gordon Wilkins, Pacific district representative of Ironrite ironer with headquarters at Oakland, and Francis E. Ford, representing Ironrite in Washington and Oregon, surveying the boat house prospects along Lake Washington, Seattle, from Mr. Ford's floating palace

• ELY C. HUTCHINSON, former editor of *Power*, has joined the staff of the J. G. White Engineering Corp. at 60 Broad St., New York. Mr. Hutchinson is well known on the coast, where he was president and general manager of the Pelton Water Wheel Co. of San Francisco from 1926 to 1929, and a member of the San Francisco Engineers Club. In his new capacity his services will be available to industrial and manufacturing plants and public utilities.

•

• JAMES B. BLACK, president of the Pacific Gas & Electric Co., is chairman of the western regional committee to solicit funds for the Thomas Alva Edison foundation. Permanent fund for support of 100 Edison scholarships will be established. Mr. Black's committee will operate in California, Nevada, Idaho, Utah, Washington and Oregon.

•

• F. A. KETCHUM, president of the Graybar Electric Co., Inc., last month conferred in Los Angeles with Harry L. Harper, in charge of Pacific district headquarters. Mr. Ketchum predicted unprecedented home and factory electrification in Southern California upon availability of power from Boulder Dam. He visited all of the Coast Graybar houses before returning East.

•

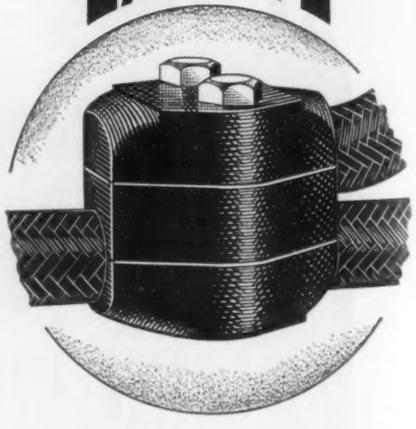
• G. H. CRANDALL, Puget Sound Power & Light Co. merchandise salesman has been promoted to lighting engineer for the northeastern district.

For COMMERCE

CROCKER FIRST NATIONAL BANK
OF SAN FRANCISCO

Member Federal Deposit Insurance Corporation

BURNDY *Insulated* **TAPIT**



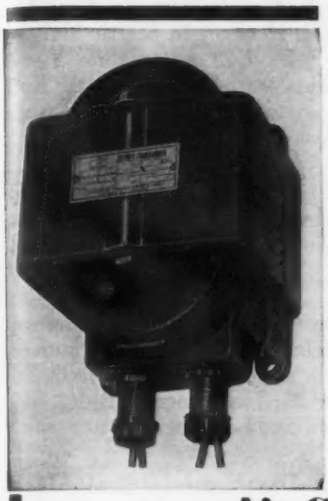
A completely insulated cable tap can be made easily and quickly with the Burndy Insulated Tapit, type PG. It is available for any cable size and combination of cables up to 500 Mcm.

Approved by Underwriters

BURNDY Engineering Co., Inc.

305 EAST 45th STREET NEW YORK CITY

LONG LIFE



in

J E F F R I E S

Air Cooled Transformers

The Air Cooled design of Jeffries Transformers assures long life together with reliable and efficient operation. Further—the high quality construction of all parts, from the carefully weighed and assembled magnetic circuit of low-loss, non-ageing steel to the completely insulated core and coil assembly, makes the maintenance cost of these transformers unusually low. Consult Jeffries on your requirements. Type S. S. Transformer, 500-1000 volt. amps. shown above.

JEFFRIES TRANSFORMER COMPANY
5706 Long Beach Ave., Los Angeles

CHROMALOX

SUPER-SPEED RANGE UNITS

"Two-Burners-in-One" is a powerful selling feature. For small utensils with switch at "Medium" *only* the inner burner heats — a 50% saving in current. You can fit any range with these units — no big stock necessary. Get the facts about the unfailing Sales Plan—Write us.

EDWIN L. WIEGAND CO.
PITTSBURGH, PA.

Represented by

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
1501 N. W. Kearny St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
912 E. 3rd St., Los Angeles, Calif.

THE PETERSON COMPANY
1921 Blake St., Denver, Colo.

Westinghouse Round-Up Draws Westerners

Western States figured prominently at Mansfield, Ohio, this year, when 150 Westinghouse sales "quota busters" gathered for the annual round-up. From the West were two of the six women: Mrs. M. Stark, La Junta, Colo., and Mrs. C. White, Pittsburg, Calif. Other Westerners in attendance were:

Guests: Ed Price, Los Angeles; John Longden, Salt Lake City, and Sam Soble, Portland. Dealer supervisors: G. M. Cramer, San Diego; M. Stampfli, Reno; E. Isenhower, C. B. Lane and S. A. Searle, all of Los Angeles.

California quota-busters: L. R. Spates, San Mateo; L. E. Minar, Oakland; K. S. Newhouse, San Jose; Harry S. Lacey, Oakland; H. Chapman, Los Angeles; W. R. Graul, Pasadena; Harlow Alabaster, Coachella; O. Rostad, Turlock, and Elmer Larson, Stockton.

Colorado: Middleton Stark, La Junta, and R. J. Schneider, Denver; and Sam Klein, Las Cruces, N. M.; J. D. Matlock, Globe, Ariz.; N. Rubenstein, Eugene, Ore., and Joe J. Hon, Boise, Idaho.

•

• JAMES W. CAREY, for three years chief engineer for the Washington State department of public works, resigned to accept appointment to the U. S. Senate as engineer-inspector of P.W.A. for Washington. Heading a large staff of engineers, he will supervise all Washington State P.W.A. construction. During the past three years as chief engineer, he has been in charge of engineering valuation and rate investigations involving nearly all public utility corporations in the State.

•

• PAUL J. OST heads San Francisco's newly created Electric Power Bureau with supervision of Moccasin creek and Early intake plants and street lighting in the city. San Francisco Utilities Commission increased his salary to $10,000, from the $7,800 he earned as chief electrical engineer for the commission.

•

• E. C. ALEXANDER has been made lighting specialist for the Southern Colorado Power Co. Mr. Alexander was formerly with the power companies in Chicago.

•

• FRANCIS ANTHONY LAVIGNE, known as "Tony" to his many friends in the electrical industry in California, died in San Diego April 8 after a brief illness. Formerly lighting sales engineer for Westinghouse Electric & Manufacturing Co., in San Francisco, he was later salesman for Associated Wholesale Electric Co. in northern California. During the war he was a flyer and attained the rank of lieutenant. At the time of his death he had gone to San Diego to supervise the industrial gas exhibit at the exposition.

We Are In Business

TO GIVE

SERVICE

GEO. E. HONN COMPANY
420 Market St., San Francisco, Cal.

Manufacturers Representatives for

Tree Trimming Equipment
● Bartlett Manufacturing Co.

Friction and Rubber Tapes
● Clifton Manufacturing Co.

Pyrex Insulators
● Corning Glass Works

Transformers
● Gardner Electric Mfg. Co
Power and Distribution Transformers
● Lee Skipwith & Co.
Niagara-Air Insulated Current Transformers

Poles and Cross Arms
● Mineralized-Cell Wood Preserving Co.

Cable Grips
● Kellems Products Inc.

Fuses, Cutouts, Protective Devices
● Schweitzer & Conrad, Inc.

Crapo
GALVANIZED PRODUCTS

Seven Wire Steel Strand

Telephone and Telegraph Wire

Crapo Galvanized Steel Strand is quickly, easily and economically served. Its *pure zinc* coating is so adherent and so ductile that it withstands vigorous bending and twisting without cracking or peeling. This insures corrosion-resisting joints, longer years of service, lower maintenance costs.

Crapo Galvanized Seven Wire Steel Strand and Telephone and Telegraph Wire are available in all standard grades and sizes.

Indiana Steel & Wire Co.
Muncie, Indiana

...about the Trade

• H. R. BASFORD CO., distributor for Kelvinator refrigerators and for Prima washers and ironers in northern California, has just moved into new quarters in a new building at 425 Second St., San Francisco. Formerly located at 665 Howard St., growth of the company found the facilities cramped and larger quarters needed. The new building is adjacent to the San Francisco-Oakland bridge viaduct and has large warehouse space and track facilities. The second floor is used for executive offices, a large display of all the gas and electric appliances distributed by the company and meeting rooms for sales training of dealers' sales staffs.

•

• EXCLUSIVE DISTRIBUTOR for American Beauty household washing machines in Washington, Oregon, Montana and Central Idaho is the F. B. Connelly Co., 1015 Republican St., Seattle, as the result of appointment announced by S. D. Getz, vice-president of the Getz Power Washer Co.

•

• GRAYBAR ELECTRIC CO. will open at 1723 L St., Sacramento, Calif., early this month. Personnel at the new house has not yet been announced.

• MONTGOMERY BROTHERS, manufacturers' distributors, have announced the moving of their Portland, Ore., branch office and warehouse from 524 Southwest Pine St. to larger and better equipped quarters at 1501 Northwest Kearney St., Portland. The company represents exclusively in eight Western states, Hawaii and Alaska the Edwin L. Wiegand Co., Russell Electric Co., John Wood Manufacturing Co., Filler Machine Co., Ainsworth Lighting, Inc., George W. Prentiss & Co. and Air Devices Corp.

•

• BEN FRANKLIN CLUB, of Los Angeles, staged a golf tournament recently at which Clem Purviance won the cup, William Cranston the low gross honors and first prize in the cash sweepstakes and Bill Caffray second prize.

•

• MACGREGOR & SOLLIE, INC., studios for making electrical transcriptions, have purchased a new building at 729 South Western Ave., Hollywood, and are moving their transcription studios and laboratory from San Francisco to that location.

•

• BOYLE FURNITURE in Salt Lake City has been authorized dealer there for Dexter electric washing machines.

• KELLEMS PRODUCTS, INC. has appointed as distributors on the Pacific Coast George E. Honn in San Francisco; Farnham & Cunningham in Los Angeles; W. R. Hendrey in Seattle and the Franklin Sales Co. in Denver. These appointments were made by Miss Kellems, proprietor of the concern, on her recent trip to the Pacific Coast.

•

• BUTTE ELECTRICAL & MANUFACTURING CO., Inc., San Francisco, recently moved from 509 Polk St. to 24 Sterling St.

•

• GUY COOPER, Pacific Coast manager, Warren Telechron Co., recently moved his address from 1254 West Sixth St. to Room 1126, Transamerica Bldg., 649 South Olive St., Los Angeles.

•

• WILL H. DAVIE, president of Allied Industries, Inc., announced on April 1 the appointment of H. L. "Tiny" Harkness as manager of the San Francisco district for the company. Mr. Harkness has been a salesman for Allied Industries for a number of years and is well known to the trade throughout northern California.

•

• MANAGEMENT of the appliance department of Seiberling-Lucas Co., Portland, has been assigned to Jack Hayden, formerly with the S. J. McCormick Co. Mr. Hayden is adding electric ranges to a line already including refrigerators, radios and washers.

•

• AMERICAN LAVA CORP., Chattanooga, Tenn., has announced the appointment of the Electric Material Co., San Francisco and Los Angeles, as California representative for its ceramic insulation.

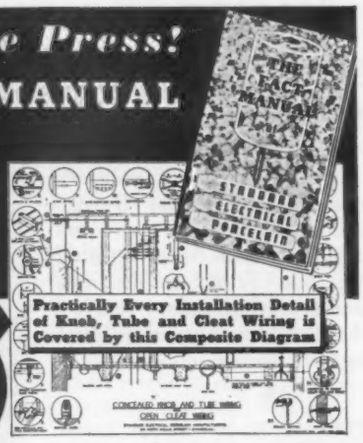
•

• NATIONAL ELECTRIC SUPPLY CO., formerly located at 1671 West Eleventh St., recently moved to a new location at 308 West Fourteenth St., Los Angeles.

Just off the Press!

THE FACT MANUAL

The First Manual of its kind ever published on the Knob and Tube Wiring System


THE FACT MANUAL
Practically Every Installation Detail of Knob, Tube and Cleat Wiring is Covered by this Composite Diagram

NEVER BEFORE AN INSTALLATION DIAGRAM LIKE THIS!

A COMPLIMENTARY COPY
for EVERYONE in the ELECTRICAL INDUSTRY

Compiled in this Manual are the facts concerning the Porcelain Knob, Tube and Cleat wiring system which have brought this wiring method back to its present overwhelming popularity. In addition to the Diagram of Installation Details, the Manual contains 16 pages of information of vital importance to the electrical industry on the proper installation and selling of this economical and permanent wiring method. Quantity is limited . . . so mail coupon or write Dept. C today.

RUSH me complimentary copy of Fact Manual
☐ Contractor ☐ Electrician ☐ Utility Official
Name .....
Street .....
City ..... State .....
Dept. C

STANDARD ELECTRICAL PORCELAIN MANUFACTURERS
201 N. WELLS ST., CHICAGO, ILLINOIS

PROFESSIONAL SERVICES

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

80th St. and East End Ave., New York

ARTHUR R. KELLEY
CONSULTING ENGINEER

Reports and Valuations, Public Utility Industrial Properties

Edison Bldg. Los Angeles

...in New Equipment

Silent, Long-Life Household Switch Developed

Noise and wear, which mar even the performance of the simple home wall-switch, have been eliminated in a new switch, reported developed by the General Electric Co. No larger than a marble, the switch utilizes the mercury-break principle.

Sealed in hydrogen within the switch are four grams of mercury. A twenty-degree rotation turns on the switch. The mercury flows through an opening in a disk of ceramic material, filling a gap between two ¾-in. chrome-steel cups, and thus establishing contact. Within each cup a tiny plate, coated with 2/10 mil. of platinum, improves the mercury-to-metal contact.

In the company's Schenectady laboratory, a test unit of the switch has been silently turning a 200-watt incandescent lamp on and off for the last two years. Without failure or apparent wear, it has performed this operation more than 65 million times.

●

Eye-Appeal in Electric Irons

Taking the name of a streamlined train, the colors of the modern automobile, and a half-dozen other pointers from twentieth century engineering, Brannon Inc., 14307 Third St., Detroit, has produced a line of electric irons, called the "Zephyr." Heat radiating fins separate the handle from the iron, 36 sq. in. of ironing surface are provided, and the streamline design of the iron is emphasized in combinations of chromium with deep red, green or black.

Two models, a Cord-Less-Matic and a Cord-O-Matic, are available in 4 and 6-lb. sizes. An interesting marketing feature is the offer of a deluxe combination of a 4-lb. and a 6-lb. iron together on one stand.

●

Buffeteria Is Name Of Roaster Converter

Cooked food can be served hot and kept hot in the new Buffeteria, an appliance developed by the Swartzbaugh Mfg. Co., to be used with their No. 656 Everhot electric roaster. Consisting of a chrome deck equipped with two 2-quart capacity red-lined vitreous enameled pans with chrome covers, the Buffeteria converts the roaster into a buffet server.

Mattress Heater Offers New Convenience

No cold feet, no bumps in the bed, and no overheating are the comforts promised users of the Murray mattress heater by the E. R. Murray Electrical Specialties, 5563 Taft Ave., Oakland, Calif. The Murray heater is designed to be tied permanently to the mattress under the lower sheet, eliminating entanglements with cord or pad and complicated efforts to maneuver a pad or hot-water bottle into an effective position.

The patented woven heating element is employed. Heating is distributed over 1,080 sq. in. of pad surface. Thermostatic control maintains temperature. Maximum wattage is 150. To provide convenient control, the heater is equipped with a switch which can be pinned to the mattress near the pillow.

●

Burndy Hot-Line Connector

Hottap is the trade name of a connector for rapidly attaching cable to a transmission or distribution line, now being offered by Burndy Engineering Co., of New York. The connector can be installed with the line either dead or energized. Built with but two moving parts, it is designed so that, after being hooked over the line and the operating stick removed, the weight of the suspended cable will help to hold the clamp on the line. Six sizes accommodate line sizes from 8 to Mcm cable.

●

Swing Feature in Motor Starter

Speed and facility in installation, ease in maintenance are specified in the design of a new motor starter, now introduced by Square D. Feature of construction is the hinging of the interior, allowing it to swing out of the way and providing large wiring space. Polyphase ratings are ¼ to 5 hp. at 220 volts, ¼ to 7½ hp. at 440 and 550 volts.

●

Sectionalizing Switch For Rural Lines

New rural line sectionalizing switches have been added to the lines offered by Schweitzer & Conrad, Inc., Chicago. Of the horn gap tilting-insulator type, the switches feature ease of mounting, multi-point floating high pressure contacts, easy operation, and universal joints on the "grasshopper," permitting angular connection without strain. Capacities offered are 200 amp., 7,500 to 34,500 volts, and 400 amp., 7,500 and 15,000 volts.

Three Crawford Ranges in Debut

Three new Crawford electric ranges in the lower-price field have been announced by Walker & Pratt Mfg. Co., Boston. All are equipped with "hilo" toggle self-indicating switches and stabilized heat ovens which can be equipped for automatic time control at slight additional cost.

Models are Cottage, 16-301; Compact, 16-401, and Cupboard, 16-451. The first has three surface units, the latter two have four including a simmering unit. All have 16-in. door-type ovens with utensil drawer, to which the Cupboard model adds a utility compartment.

●

Thermostat for Remote Control

Claiming several advanced features for its product, Hart Mfg. Co., Hartford, Conn., has introduced a new hydraulic thermostat. For use in any domestic or industrial heating equipment where remote control of temperature is desired, the thermostat is claimed to be free from damage in event of sticking, capable of convenient location at an exterior point where control is desired. Calibrations can be made without removing the knob. Low voltage pilot light with red bulls-eye, to indicate when temperature is obtained is optional.

●

Tentiometer Developed For Small Cables

Tension measurement and equalization in small cables can now be accomplished by use of an instrument weighing only 17 oz. Developed by the Martin-Decker Corp. of Long Beach, Calif., the device measures 3½ in. in overall height.

Requiring no special bushings for cables of different sizes, the tentiometer operates on the deflection principle by clamping directly on the cable. Loads from 10 to 200 lb. can be measured on cables up to 3/16-in. diameter. The device is self-contained and adjusts automatically for temperature changes. Developed upon request of airplane manufacturers, it is finding application in numerous other fields.

...in Trade Literature

"ARTIFICIAL LIGHT AND ITS APPLICATIONS" is a new text book prepared for use in connection with employee educational plans which the Westinghouse Lamp Co. is sponsoring through its Better Light-Better Sight program. Containing thirteen chapters, the text covers all phases of lighting, including new sections on vapor illuminants and other new light sources. Tables and graphs eliminate computations. Illustrated profusely with pictures showing every phase of lighting, the 258-page book, printed in typewriter type by the photo-litho process, may be obtained at the printing cost of 50 cents, from the commercial engineering department of Westinghouse Lamp Co., Bloomfield, N. J.

●

FLOODLIGHTING—Floodlight layouts for all manner of sports, including dog race tracks and badminton courts, are presented in the new Bulletin 2299, entitled Floodlights, published by the Crouse-Hinds Co., Syracuse, N. Y.

YOUR POCKETBOOK, by Walter Ayers, sales manager of Electromaster Inc. Published by Electromaster Inc. Price $1. General sales principles are applied to the specific problem of selling electric ranges in this pocketbook. Not a text, it enumerates practical selling suggestions, and methods of approaching definite situations, and includes a bibliography of accepted works on selling. It is based on Mr. Ayers' experience in retail selling and in contacting salesmen of electric utilities throughout the United States.

●

MICROMAX SMOKE-DENSITY RECORDERS is the title of a new 16-page catalog issued by Leeds & Northrup Co., Philadelphia, describing the instruments of the same name. This electrical equipment measures smoke density at the stack, indicates and records it, and signals changes if desired.

●

KELVINATOR RANGES and water heaters are pictured in big, clear-cut halftones in a bulletin just released. Simplicity of electric cooking, the attractiveness of electrically-cooked dishes and the modern lines of Kelvinator products are emphasized. First complete bulletin on the new ranges, it includes tabulated specifications for the line.

MOTHER'S DAY and June bride promotion by General Electric Co., has been set forth in brochure outlining market plans, listing magazines and newspapers to be used as media illustrating sales helps and appliances used in the promotion.

●

INTERFERENCE SUPPRESSORS for automobile radios are treated on two new information sheets published by the Ohio Carbon Co., 12508 Berea Road, Lakewood, Ohio. Test-data, dimensions, prices and hook-ups for the "Ohiohm" series of suppressors are included.

●

WESIX, INC., has just prepared an extensively illustrated broadside folder on electric heat for distribution by mail or through the trade. Illustrated by photographs of homes throughout the country employing Wesix heaters and by illustrations of the construction and other features of the equipment, the brochure carries the title "From California to All America."

●

SWITCHES DESCRIBED — Vacu-Break safety switches are illustrated and described in a new bulletin published by the Bulldog Electric Products Co., 7610 Jos. Campau Ave., Detroit, Mich.

WHERE TO BUY IT IN THE WEST

Roller-Smith Company

3 Barclay St., New York City — Works: Bethlehem, Pa.

★ INSTRUMENTS (Indicating and Graphic) ★ CIRCUIT BREAKERS (Air and Oil)
★ INSTRUMENT AND CONTROL SWITCHES
★ SWITCHGEAR ★ RELAYS

Sales Agents: Electric Material Co., San Francisco and Los Angeles. J. G. McDougall, Seattle. Mark G. Mueller, Denver. T. E. Geary, Omaha

Air Conditioning
Frigidaire Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Kelvinator Corp.

Ammeters and Voltmeters
Bristol Co.
General Elec. Co.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec. Instr. Corp.

Anchors, Guy
A. B. Chance Co.
James R. Kearney Corp.

Anchor and Guy Rods
A. B. Chance Co.
General Elec. Co.
Hubbard & Co.

Appliances, Household
Edison Gen. Elec. Appliance Co., Inc.
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
McGraw Elec. Co.
National Enameling & Stamping Co.
The Silex Co.
Waters-Genter Div.
Westinghouse Elec. Supply Co.

Boxes
General Cable Corp.
General Elec. Co.

Bus Fittings
Burndy Eng'g Co.
General Elec. Co.

Brackets, Wood
Locust Pin Co.

Breakers

Air Circuit Breakers
General Elec. Co.
I-T-E Circuit Breaker Co.
Roller-Smith Co.
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.

Oil Circuit Breakers
Allis-Chalmers Mfg. Co.
General Elec. Co.
Pacific Elec. Mgf. Corp.
Roller-Smith Co.
Westinghouse Elec. & Mfg. Co.

Buses
Aluminum Co. of America

Cable Accessories
General Cable Corp.
General Elec. Co.
John A. Roebling's Sons Co.

Cables
Aluminum Co. of America
American Steel & Wire Co.
Columbia Steel Co.
Crucible Steel Co. of America
General Cable Corp.
General Elec. Co.
Graybar Elec. Co., Inc.
Maydwell & Hartzell, Inc.
National Elec. Products Corp.
Providence Insulated Wire Co.
John A. Roebling's Sons Co.
United States Steel Corp.
Westinghouse Elec. & Mfg. Co.

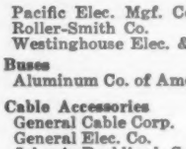
Carbon Brushes
National Carbon Co., Inc.

Carbon Products
National Carbon Co., Inc.

Chimes
Square D Co., Inc.

Coffee Makers
The Silex Co.

Coil Winding
Jeffries Transformer Co.


MICA UNDERCUTTER WORKS IN SPACE 2¾"
Powerful. For shop and field use. Try it for 10 days free.
IDEAL COMMUTATOR DRESSER CO.
1042 Park Ave. Sycamore, Ill.

Commutator Dressers
Ideal Commutator Dresser Co.

Compounds, Insulating
General Cable Corp.
General Elec. Co.

Condensers, Electric
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Conduit
Aluminum Co. of America
General Elec. Co.
Youngstown Sheet & Tube Co.

Conduit, Underground
Fire Proof Wall Co.
Johns-Manville Corp.

Connectors
Burndy Eng'g Co.
James R. Kearney Corp.

Controllers
Allis-Chalmers Mfg. Co.
Clark Controller Co.
General Elec. Co.
Square D Co.
Westinghouse Elec. & Mfg. Co.

Cutouts
James R. Kearney Corp.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Demand Control
General Elec. Co.
Wesix, Inc.

Distribution Specialties
General Elec. Co.
James R. Kearney Corp.
Maydwell & Hartzell, Inc.
St. Louis Malleable Casting Co.

Electrodes, Arc Welding
John A. Roebling's Sons Co.
General Elec. Co.

Fans
General Elec. Co.

Farm Electrification Equipment
General Elec. Co.

Fittings, Conduit
General Elec. Co.

Fittings, Insulator
Brewer-Titchener Corp.

Fixtures, Lighting
General Elec. Co.
Smoot-Holman Co.

Floodlighting
General Elec. Co.
S & M Lamp Co., Inc.
Smoot-Holman Co.

Gasoline
Union Oil Co.

Generators
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Graphite Products
National Carbon Co., Inc.

Ground Rods
Crucible Steel Co.
Maydwell & Hartzell, Inc.

Heaters, Air
Edison Gen. Elec. Appliance Co.
Noblitt-Sparks Industries, Inc.
Thermador Elec'l Mfg. Co.
Wesix Inc.
Edw. L. Wiegand Co.

Heaters, Water
Edison Gen. Elec. Appliance Co.
Fowler Mfg. Co.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
Sandoval Sales Co.
Standard Elec. Stove Co.
Thermador Elec'l Mfg. Co.
Wesix Inc.
Westinghouse Elec. & Mfg. Co.

Heating Element—Repair Part
Edw. L. Wiegand Co.

Instruments, Measuring and Recording
See Ammeters, Voltmeters, Wattmeters.

Insulation
General Elec. Co.
Johns-Manville Corp.

Insulators
Brewer-Titchener Corp.
Corning Glass Works
Graybar Elec. Co., Inc.
Hemingray Glass Co.
Geo. E. Honn Co.
Lapp Insulator Co., Inc.
McLaughlin Glass Co.
Owens-Illinois Glass Co.
Westinghouse Elec. & Mfg. Co.

Where to Buy It in the West—*Continued*

Ironers
General Elec. Co.
Savage Distributing Co.

Knobs, Tubes, Cleats
Standard Elec'l Porcelain Mfrs.

Lamps, Mazda
General Elec. Co.
Westinghouse Lamp Co.

Lamps, Student
Lumidor Mfg. Co., Inc.

Lamps, Sun
General Elec. Co.

Lighting Equipment
Smoot-Holman Co.
Wuelker Flexo-Dome Co.

Line Material
Maydwell & Hartzell, Inc.

Meters
The Bristol Co.
General Elec. Co.
L. A. Nott
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec'l Instrument Corp.

Motors
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Motor Starters
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Oil, Lubricating
Associated Oil Co.
Union Oil Co.

Oil, Transformer & Switch
Associated Oil Co.
General Elec. Co.
Union Oil Co.

Panel Boards
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Photoelectric Cells
General Elec. Co.
Weston Elec'l Instrument Corp.

Pins, Wood
Locust Pin Co.

Pole Line Hardware
Brewer-Titchener Corp.
General Electric Supply Corp.
Graybar Electric Co., Inc.
Hubbard & Company
Joslyn Co. of California
Kortick Mfg. Co.
Maydwell & Hartzell, Inc.
Western Hardware & Tool Co.

Porcelain
Standard Elec. Porcelain Mfrs.

Public Utilities
California Oregon Power Co.
Idaho Power Co.
Mountain States Power Co.
Northwestern Electric Co.
Pacific Gas and Electric Co.
Pacific Power & Light Co.
Portland General Electric Co.
Puget Sound Power & Light Co.
San Diego Cons. Gas & Elec. Co.
San Joaquin Light & Power Corp.
Southern California Edison Co. Ltd.
Utah Power & Light Co.
Washington Water Power Co.

Pullers, Slack
A. B. Chance Co.

Pumps
Pelton Water Wheel Co.

Range Units
Edison Gen. Elec. Appliance Co.
Edwin L. Wiegand Co.

Ranges
Edison Gen. Elec. Appliance Co.
General Elec. Co.
General Elec. Supply Corp.
Kelvinator Corp.
Lindemann & Hoverson Co., A. J.
Malleable Iron Range Co.
Standard Elec. Stove Co.
Steiger & Kerr Stove & Fdry. Co.
Walker & Pratt Mfg. Co.

Refrigerators
Frigidaire Corp.
General Elec. Co.
General Elec. Supply Corp.
Graybar Elec. Co., Inc.
Kelvinator Corp.
Malleable Iron Range Co.
Westinghouse Elec. & Mfg. Co.

Relays
General Elec. Co.
Hart Mfg. Co.
Roller-Smith Co.

Rheostats & Resistors
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Service Organizations
Crocker First National Bank
Elec'l Testing Labs.
McGraw-Hill Book Co.
Northwest Elec. Light & Power Association
Pacific Coast Elec'l Ass'n
Pacific Coast Elec'l Bureau

Strand, Guy
Crucible Steel Co.
Maydwell & Hartzell, Inc.
Pacific Wire Rope Co.

Switchboards
Allis-Chalmers Mfg. Co.
General Elec. Co.
Roller-Smith Co.
Square D. Co., Inc.

Switches, Heater
Bryant Elec. Co.
General Elec. Co.
Hart Mfg. Co.

Switches, High Tension
James R. Kearney Corp.

Switches, Meter Test
General Elec. Co.
Meter Devices Co.

Switches—Pressure and Temperature
The Bristol Co.
Hart Mfg. Co.

Switches, Safety
Colt's Patent Fire Arms Mfg. Co.
General Elec. Co.
Square D Co., Inc.
Westinghouse Elec. & Mfg. Co.

Switches, Thermostat Controlled
Colt's Patent Fire Arms Mfg. Co.
General Elec. Co.
Hart Mfg. Co.
Thermodor Elec'l Mfg. Co.

Switches, Time
General Elec. Co.
Sangamo Elec. Co.

Switchgear
Allis-Chalmers Mfg. Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.

Tapes—Friction and Rubber
Clifton Mfg. Co.
Geo. E. Honn Co.

Telephone Systems—Private
American Automatic Elec. Sales Co.

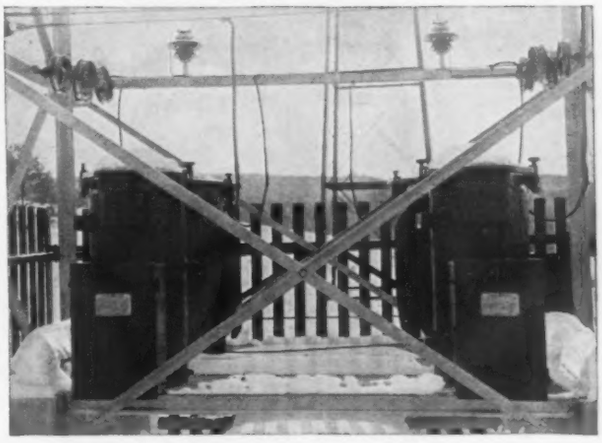
Terminals, Cable
General Cable Corp.
General Elec. Co.

Testing Devices
Electrical Facilities, Inc.

Tools, Live Line
A. B. Chance Co.
James R. Kearney Corp.
Western Hardware & Tool Co.

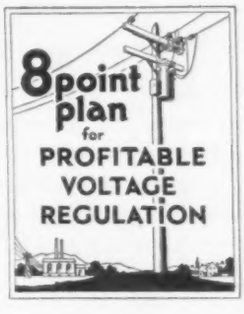
Transformers
Allis-Chalmers Mfg. Co.
Gardner Elec. Mfg. Co.
General Elec. Co.
Jeffries Transformer Co.
Sangamo Elec. Co.
Western Transformer Co.
Westinghouse Elec. & Mfg. Co.

Increased Revenue Pays for Service Improvement on this Circuit



These two G-E 10-kva, 2400-volt branch-feeder four-step regulators made service improvement profitable

G-E Branch-feeder Step Regulators Return 28% Annually on the Investment



AN improvement in service, together with a profitable investment, resulted from the installation of these branch-feeder four-step voltage regulators. They were installed last July, about two miles from the station, at the load center. Their installed cost was approximately $1200, and it is now estimated that the regulators, by maintaining proper voltage levels, are preventing loss of revenue from this circuit and are returning 28 per cent on the investment annually. In addition, the operating company is now able to add new load to the circuit, and a substantial increase in revenue is anticipated from this source.

Saving in Capital Investment

Station-type induction regulators were also considered, but G-E branch-feeder four-step regulators were selected, since they afforded a saving of $800 in capital investment.

Regulation for Every Vital Point on the System

General Electric—in the 8 Point Plan—offers economical, profitable voltage regulation for every point on the system; from the generator to the consumer. Let us make recommendations for the most profitable type of regulation for your lines. Remember, there's revenue in regulation. General Electric, Schenectady, N. Y.

350-125

GENERAL ELECTRIC

"These Machines must meet any Emergency . . . . SPECIFY "SA" BRUSHES"

● Electrical equipment must be designed to meet any emergency—sustained overloads, sudden peaks or heavy mechanical shocks. Modern industry will not put up with failure.

The designing engineer carefully considers every element entering into the product he is creating. There must be no weak point. Every part must be capable of meeting the emergencies of heavy duty service.

That is the reason designing engineers specify "SA" Series Brushes.

That is also the reason operators, who have tried them, specify "SA" Series grades for all equipment in their charge.

●

They have proved for others their ability to meet emergencies.

Let Them Prove It for You!

●

There is a National Pyramid Brush for Every Class of Service

NATIONAL CARBON COMPANY, INC.
CARBON SALES DIVISION, CLEVELAND, OHIO
Unit of Union Carbide UCC and Carbon Corporation
Branch Sales Offices: New York, Pittsburgh, Chicago, San Francisco

Where to Buy It in the West—*Continued*

Tubing, Elec'l Metallic
Aluminum Co. of America

Turbines
Pelton Water Wheel Co.

Valves
Pelton Water Wheel Co.

Washers, Clothes
Elec't Appliance Service Corp.
General Elec. Co.
Little Giant, Inc., Ltd.
Savage Distributing Co.
Washing Machine Parts Co.

Wattmeters
Bristol Co.
General Elec. Co.
L. A. Nott
Roller-Smith Co.
Sangamo Elec. Co.
Westinghouse Elec. & Mfg. Co.
Weston Elec. Instrument Corp.

Water Wheels
Pelton Water Wheel Co.

Wire
Aluminum Co. of America
America Steel & Wire Co.
Columbia Steel Co.
Crescent Ins. Wire & Cable Co.
Crucible Steel Co.
General Cable Corp.
National Elec. Products Corp.
United States Steel Corp.
Westinghouse Elec. Supply Co.

Wiring Supplies
Associated Sales Engineers
Bryant Electric Co.
Gen. Elec. Supply Corp.
Graybar Elec. Co., Inc.
General Elec. Co.
Graybar Elec. Co., Inc.
Hart Mfg. Co.
Indiana Steel & Wire Co.
Maydwell & Hartzell, Inc.
Pacific Wire Rope Co.
Providence Insulated Wire Co.
John A. Roebling's Sons Co.
Westinghouse Elec. & Mfg. Co

INDEX TO ADVERTISERS
May, 1936

Allis-Chalmers Mfg. Co.	11
Aluminum Company of America	7
American Automatic Electric Sales Co.	59
Benjamin Electric Mfg. Co.	5
Brewer-Titchener Corp.	56
Burndy Engineering Co., Inc.	62
California Oregon Power Co.	34, 35
Chance Co., A. B.	56
Colt's Patent Fire Arms Mfg. Co.	58
Columbia Steel Co.	8
Corning Glass Works	2, 3
Crocker First National Bank	62
Edison General Elec. Appliance Co., Inc.	12, 13
General Electric Co.	4, 9, 57, 61, 67
Honn Co., Geo. E.	63
Ideal Commutator Dresser Co.	66
Idaho Power Co.	34, 35
Indiana Steel & Wire Co.	63
Jeffries Transformer Co.	63
Kearney Corp., James R.	60
Lapp Insulator Co., Inc.	60
Locust Pin Co.	60
Maydwell & Hartzell, Inc.	60
Mountain States Power Co.	34, 35
National Carbon Co., Inc.	68
Northwestern Electric Co.	34, 35
Owens-Illinois Glass Co.	62
Pacific Coast Electrical Bureau	Back Cover
Pacific Gas and Electric Co.	Inside Back Cover
Pacific Power & Light Co.	34, 35
Portland General Electric Co.	34, 35
Professional Directory	64
Providence Ins. Wire Co.	60
Puget Sound Power & Light Co.	34, 35
Roller-Smith Co.	66
Schweitzer & Conrad, Inc.	59
Silex Company, The	16
Southern California Edison Co. Ltd.	Inside Front Cover
Square D Company, Inc.	10
Standard Electrical Porcelain Mfrs.	64
Standard Electric Stove Co.	53
United States Steel Corp.	8, 52
Utah Power & Light Co.	34, 35
Washington Water Power Co.	34, 35
Wesix, Inc.	55
Westinghouse Electric & Mfg. Co.	14, 15
Weston Elec. Instrument Corp.	6
Wiegand Co., Edw. L.	63

HOW TO USE, DEMONSTRATE AND SELL ELECTRIC IRONING MACHINES

A Six Hour
(3 LESSON)
Course of Instruction
and PRACTICE

For all dealers salespeople thoughout P.G.and E.territory

45 signed up for the first school (in San Jose)
17 schools completed since then - 7 more to go

WOODLAND, PETALUMA, SACRAMENTO, SANTA ROSA, STOCKTON, NAPA, EUREKA

Again we salute the Electric Appliance Society for seeing a need and meeting it

●

P·G·and E·
PACIFIC GAS AND ELECTRIC COMPANY
Owned · Operated · Managed by Californians

EW 105-536

THE BEGINNING OF A NEW ERA

California's electrical age has just begun. This is more than a mere slogan. It is a prophesy for even greater efficiencies in industry—increased savings on the farm—more conveniences in the home—and extended economies in commerce.

The firm, solid foundation upon which California's electrical industry is being built, assures the fulfillment of this prophesy.

Electrical power is available to meet any need. Transmission lines distribute this energy to every part of the state. Electrical rates in California are among the lowest in the country.

This, together with the rapid development of efficient and inexpensive appliances, means profit and prosperity to those electrical dealers, who have the foresight and energy to build **their** business **now** to meet the electrical needs of the future.

Pacific Coast Electrical Bureau

● **601 West Fifth Street, Los Angeles, California** ● **447 Sutter Street, San Francisco, California**